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SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

Vol. XIII. Publication Office, Toronto, January 1st, 1919 No. 1

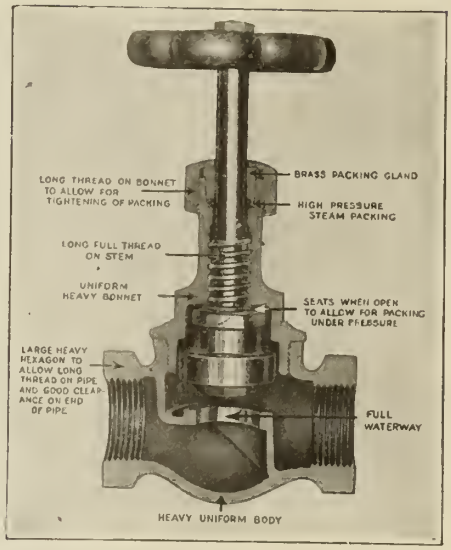
It's a Winner and We're Proud of It!

Emco Globe Valves are made in one of the most modernly equipped brass manufacturing plants under the British flag.

In examining an **Emco** you will particularly note the uniform thickness of metal, the long full threads on spindle and other features that will impress upon you the fact that you are getting full value for your money.

Emco Globe Valves are fitted with metal packing gland and are complete in every detail. Every valve is packed with high-grade packing before it leaves the factory.

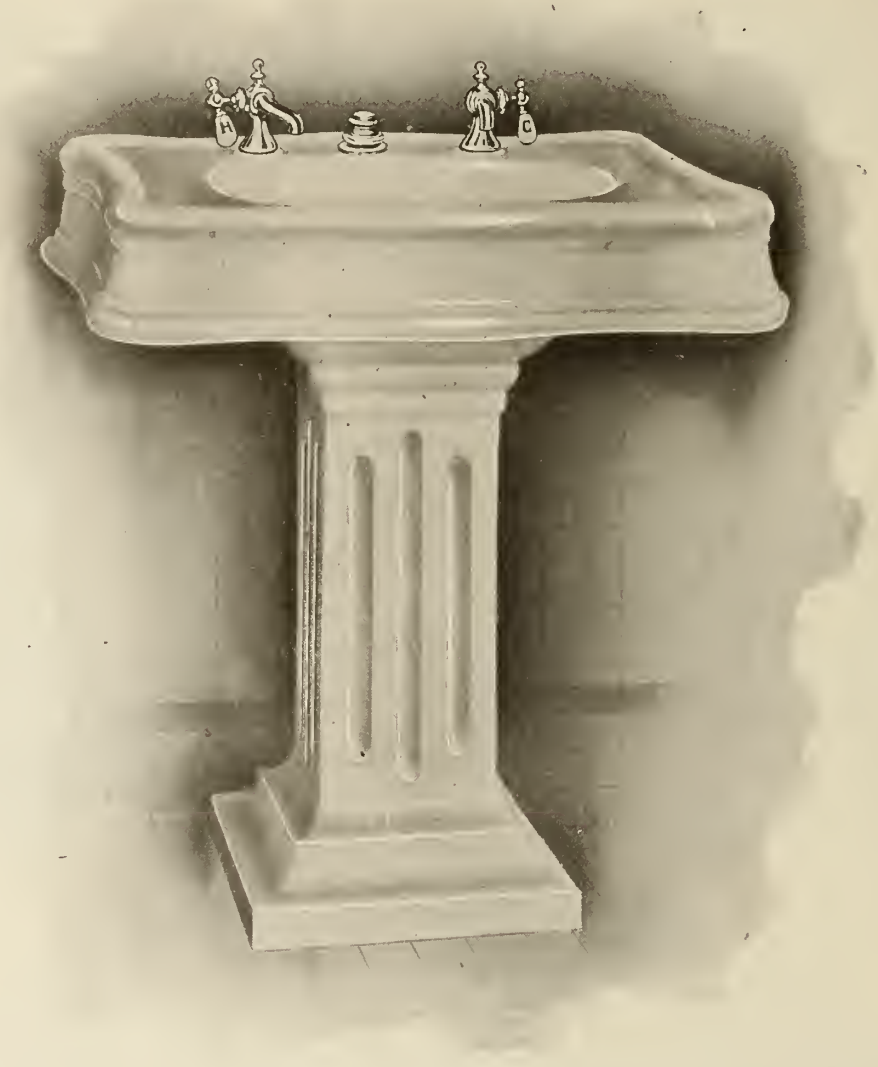
We can make prompt shipments from stock. Let us quote you our prices on your next brass goods requirements.


LONG THREAD ON BONNET TO ALLOW FOR TIGHTENING OF PACKING
BRASS PACKING GLAND
HIGH PRESSURE STEAM PACKING
LONG FULL THREAD ON STEM
UNIFORM HEAVY BONNET
SEATS WHEN OPEN TO ALLOW FOR PACKING UNDER PRESSURE
LARGE HEAVY HEXAGON TO ALLOW LONG THREAD ON PIPE AND GOOD CLEARANCE ON END OF PIPE
FULL WATERWAY
HEAVY UNIFORM BODY

EMPIRE MANUFACTURING CO., LIMITED

LONDON -:- -:- TORONTO

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While



A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for **BEAVER BRAND CAST IRON ENAMEL WARE**

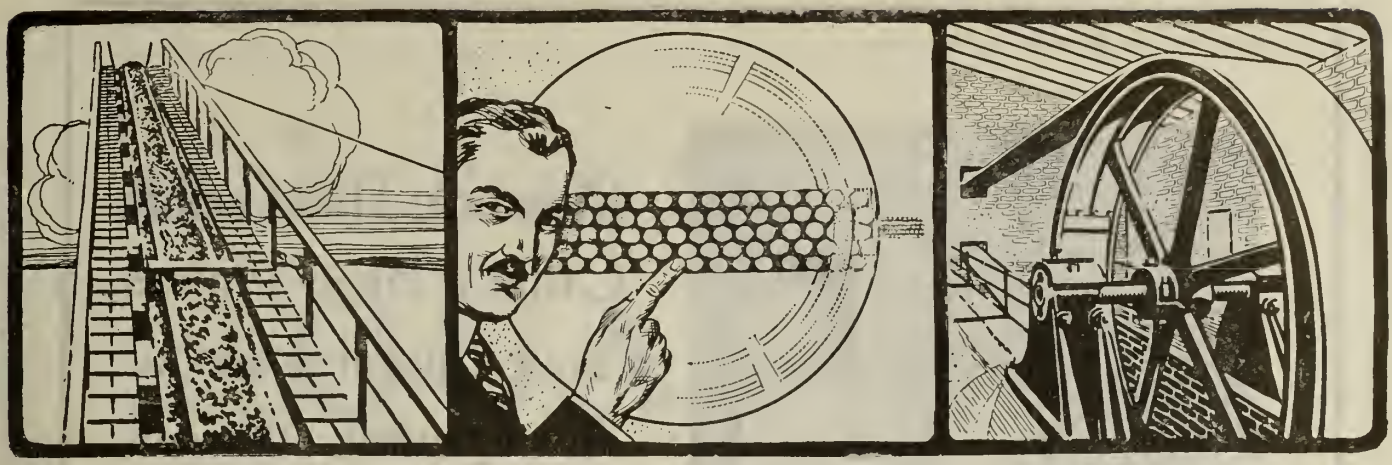
Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

ONTARIO:
Monarch Brass Mfg. Co., 71 Brown St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes, 120 Lombard St., Winnipeg



Dominion Rubber System Belting Insures Maximum Service

Dominion Rubber System Belts are built to a scientific quality standard which insures the proper width, thickness and type of construction to efficiently serve a given purpose.

Dominion Rubber Systems Belts are *one-piece belts*—with absolute uniformity, dependability, economy and satisfaction built into each foot.

The layers of strong endless fabric are saturated and embedded in special rubber which gives a toughness that is practically indestructible.

Its rubber surfacing has a tested pulley grip greater than that of any other belt made, hence it allows minimum power leakage.

Where water, acids, oils, dust, grit, belt-shifters, etc., soon ruin ordinary belting, there is a type of Dominion Rubber System Belting that will withstand the severest punishment and eliminate many replacements and delays.

The largest users of belting in Canada have proved the value and efficiency of our belting in actual service and through the special free service of our belting experts, have cut costs and speeded up production.

This free technical service is yours to command whether you are a customer or not and it opens the door to the entire facilities of the largest rubber organization in Canada with a fifty year record for producing dependable products.

If your belting problems need emergency service, phone or wire our nearest branch.

Dominion
Rubber System
Manufacturers of
Dominion Hose, Packing and Industrial Rubber Goods.
Dominion Tires, the Good Tires for every purpose.

Canadian Consolidated Rubber Co., Limited
Head Office, Montreal

Service Branches:

Halifax, St. John, Quebec, Montreal, Ottawa, Toronto, Hamilton, London, Kitchener, North Bay, Fort William, Winnipeg, Brandon, Regina, Saskatoon, Edmonton, Calgary, Lethbridge, Vancouver, Victoria.

CANADIAN CONSOLIDATED RUBBER CO. LIMITED
DOMINION RUBBER SYSTEM
AND ASSOCIATED COMPANIES

Plumbing That Counts Cannot Be—Unless Your Supplies are of A 1 Quality. We can Supply Your Needs in Plumbing.

Some Of Our Lines—

SOLDER
LEAD PIPE
SHEET LEAD
BATH TUBS
LAVATORIES
ALL INGOT METALS
SINKS
LEAD WOOL
"ARISTOCRAT" LAUNDRY TUBS
IRON PIPE AND FITTINGS
ALL BRASS GOODS

Easy Wiping Solder is the Plumber's Favorite

We have everything in stock that the plumber needs—and it's ready for prompt shipment.

Canada Metal Products are recognized everywhere — as high quality. Behind them is the reputation for the very best. Don't attempt a good plumbing job without Canada Metal Products. Let our experience help you to build your reputation for good work.

THE CANADA METAL COMPANY, LTD.

Montreal Hamilton Fraser Avenue, TORONTO Winnipeg Vancouver

WE HAVE EVERYTHING FOR THE PLUMBER

CATALOGUE "A" MAILED FREE

All Brass Goods Bear this Stamp of

QUALITY

CANADIAN
BRASS
GALT ONT.

CLOSET COMBINATIONS

Carrying the TRADE MARK below are Insured Against All Defects

Embody these in your New Year's Resolutions

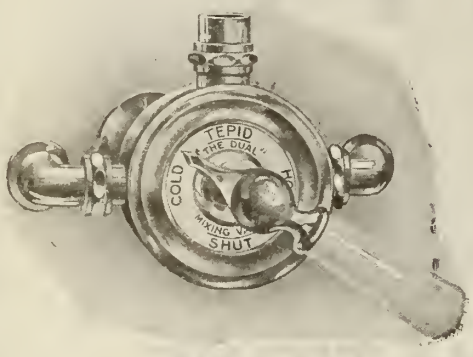
CANADIAN BRASS COMPANY, LIMITED

GALT TORONTO

G. & W. G. GUMMER, LIMITED

EFFINGHAM BRASS WORKS, ROTHERHAM, ENGLAND

And at
9 Fenchurch St.,
London



"Dual" Mixer

A valve that really mixes Hot and Cold Water, and maintains a uniform mixture.

For ease of operation, simple construction and easy installation, it has set a new standard of efficiency.

Cold Water must be turned on first, no possibility of scalding.

Made in several forms for Showers, Sprays, Operating Rooms, etc.

At the well-known works of Messrs. Brunner, Mond & Co. these valves provide baths for 2,500 employees.

G. & W. G. GUMMER, LIMITED

Manufacturers of every description of

Engineers,' Plumbers' and Sanitary Quality Brassware

"Standard"
"Perfection" Built-In Baths

Made in One Piece Enamelled All Over

These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners, meaning bathroom sanitation.

Made in 5 and 5½ foot sizes.

Illustrations on request.

Write the nearest dealer

Standard Sanitary Mfg. Co.
Limited

General Office and Factory, Royce and Lansdowne Aves., Toronto, Ontario

Toronto Store:
55-59 Richmond Street East

Winnipeg Showrooms:
76 Lombard Street

Hamilton Store:
20-28 Jackson Street West

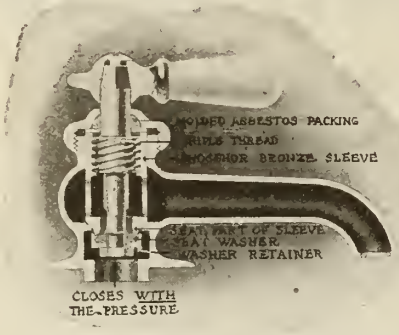
Montreal:
4 Beaver Hall Square

Calgary:
31 Canada Life Building

Vancouver:
847 Beatty Street

"MADE IN CANADA"

"Quaturn" is the Faucet



Exclusive Features
(Patented)

Here's One Thing

If you look at the cut just notice that the seat washer and retainer moves down *against* the pressure to allow the flow of water. Then it moves back *with* the pressure to close.

So it is simply impossible for the Quaturn to automatically open or to pound or to hammer.

This is only one of the features which put Quaturn in a class by itself. Other features will appear regularly, but if you write or telephone our nearest office all these features are awaiting you.

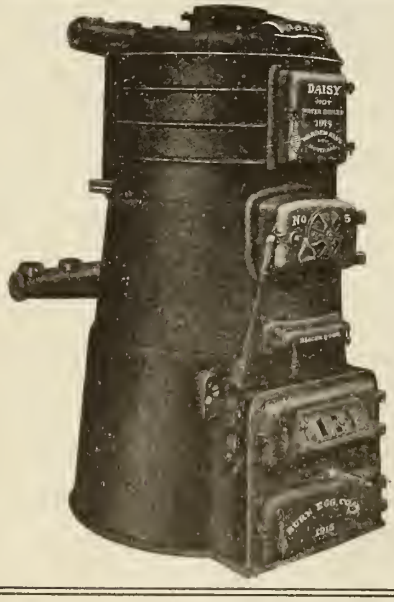
The Wallaceburg Brass & Iron Manufacturing Company, Limited

Toronto: Mr. L. N. Vanstone, 10 Wellington Street E.

WALLACEBURG, ONT. HEAD OFFICE

Montreal: J. R. Devereux & Co., 358 Beaver Hall Sq.

Over 60,000 Daisy Hot Water Boilers Now in Use—Are *You* Selling Your Share?



Daisy Hot Water Boilers are easiest to sell because they have an established reputation for exactly meeting the requirements of the modern home.

Every Daisy you instal will help build bigger business by bringing repeat orders for installation in neighboring homes later.

WARDEN KING Limited, Montreal

BRANCH OFFICE: 136 SIMCOE ST., TORONTO

—SAFETY FIRST—

USE Wolverine Thawing Steamer FOR THAWING FROZEN PIPES

Thawing Steamer

Made from

HEAVY COPPER

and equipped with

SAFETY VALVE

to prevent possible dangers of fire and explosion, perhaps loss of life.

Thawing Hose

EXTRA QUALITY

Smooth White Rubber with Heavy Wall

and

THAWING HOSE CONNECTION

for coupling and lengthening Hose. Listed in Catalog "C."

Canadian Wolverine Company, Limited

CHATHAM, ONT.

WE SPECIALIZE IN

PIPE THREADING TOOLS

Take Another Look At This Job

ESTABLISH PEACE

If you desire to establish lasting peace in your shop, you will have to furnish your men with good tools. Men will not do the same amount of work if that work is hard. The more you *INVEST* in tools if they're good tools, the less you will SPEND in labor. To invest is to establish an asset, to spend is to create a liability. Our tools will save you money and make peace in your shop.

ESTABLISH PROFIT

Work made easy becomes a pleasure. Jardine and Toledo Pipe Threading Tools make threading pipe so easy that a boy can thread a 4-inch pipe as easy as he can thread a ½-inch pipe.

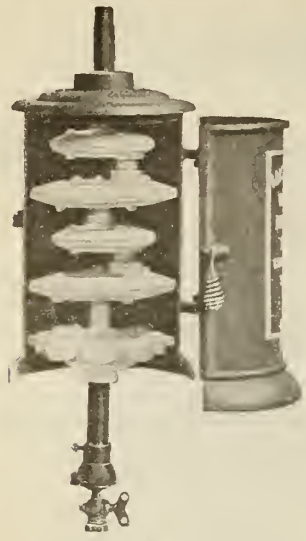
Not only so but when a thread is made with one of our tools it's a good thread. No cutting off pieces of pipe. No lost time and no leaks. That's the way to establish a profit on every job.

A. B. JARDINE & COMPANY, LIMITED, HESPELER, ONT.

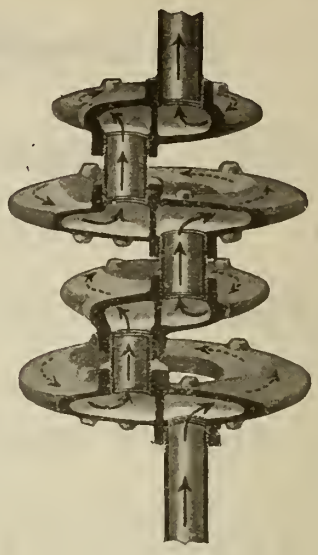
Sole makers of "Jardine" Pipe-Threading Tools.
Sole licensees to manufacture and sell Toledo Pipe-Threading Tools in Canada.
Agents, Winnipeg and West—Stanley Brock, Ltd., Winnipeg, Man.

Brockville and East—J. R. Devereux, 358 Beaver Hall Square, Montreal.

Belleville and West—W. H. Cunningham & Co., 183 Church St., Toronto, Ont.



The Completed Imperial Water Heater



Sectional View Showing Water Flow

We Put Good Money Within Your Grasp

when we put the Imperial Gas Water Heaters on the market. They are undoubtedly the most economical on gas of any other make. They are not only easy on gas, but with the perfect circulation they

"HEAT WATER IN A JIFFY"

GOODWIN & COMPANY, Limited

Sarnia, Ontario, Canada

Why Jenkins Bros'. Valves are Superior

Fig 106

They are the original renewable Disc Valves. They have more imitators than all other makes of valves combined. They have kept pace with increasing steam pressures and severe working conditions. They are of the simplest design, and can be easily repaired by any man of ordinary intelligence. They are made interchangeable in every part, and any part can be duplicated promptly and inexpensively by the dealer. In the majority of cases they can be repaired by merely changing the disc without the laborious task of regrinding.

Fig. 108

They are recognized as the Standard Steam Valves in all parts of the World, and wherever there are supply houses—Jenkins Bros'. Valves will be found. The Standard of quality never changes except to improve, and while to-day there are hundreds of imitators, the sales of genuine Jenkins Bros'. Valves are constantly increasing.

Catalogue No. 8 sent free on request.

Fig. 114

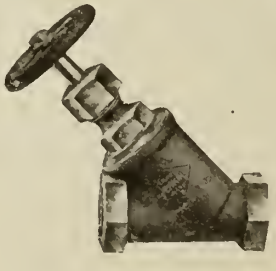


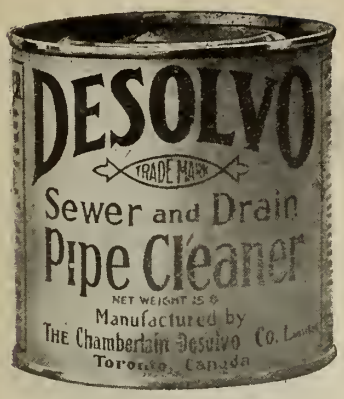
Fig. 124

HEAD OFFICE AND WORKS:
103 St. Remi St.
Montreal, Canada

JENKINS BROS.
LIMITED

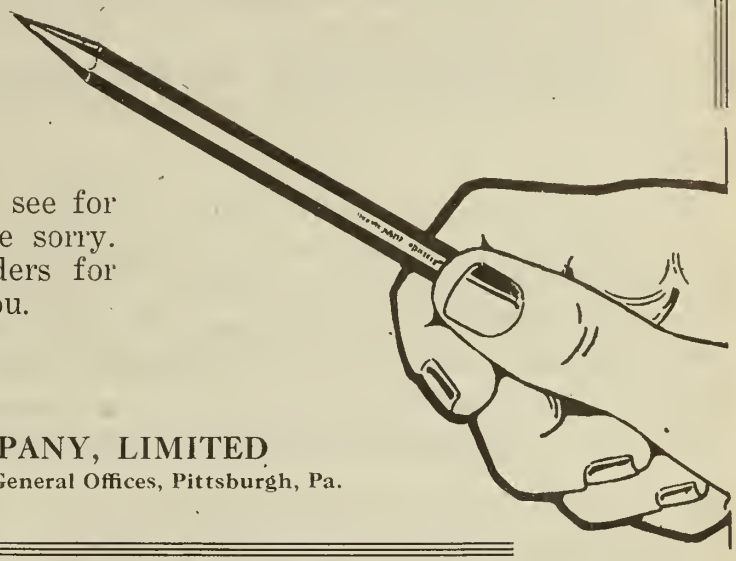
Agencies in all the Principal Countries of the World.

EUROPEAN BRANCH:
6 Great Queen Street
Kingsway, London, W.C. 2
England



The Simplest And Most Effective Cleaner You Can Use!

You can clear that clogged pipe or drain quicker with Desolvo—and at the same time do a better job—and that means money and time to both you and your customer.



Send us a trial order and see for yourself! You'll never be sorry. Desolvo is working wonders for others. It will do it for you.

Order from your jobber

CHAMBERLAIN DESOLVO COMPANY, LIMITED

Stevenson Building, Church St., Toronto General Offices, Pittsburgh, Pa.

Pipe Fittings

Made in Canada

The Brand that has the Quality

M Brand Pipe Fittings, etc., give a service and satisfaction that will invariably get you re-orders and much new business as well.

A trial of the goods will prove this claim.

CAST IRON FITTINGS

With this brand mean fittings made with iron of high tensile strength—proper proportions and correct tappings.

RECESSED DRAINAGE FITTINGS

MALLEABLE FITTINGS

With this brand mean fittings made of Air Furnace Refined Iron, reamed and tapped to gauge with perfect threads.

Standard and Extra Heavy Flanged Fittings and Flanges. Galvanizing Malleable and Gray Iron Castings of all Kinds.

International Malleable Iron Co., Limited, Guelph, Ontario, Canada

Fifty Subscriptions from One Firm

THE International Business Machines Company, of which Mr. Frank E. Mutton is vice-president and general manager, subscribed to 10 copies of THE FINANCIAL POST some months ago—these copies to go to their travelling salesmen. Now this company has increased the number of these subscriptions to 50 because the results of the experimental subscriptions have proved so satisfactory.

FRANK E. MUTTON

Mr. Mutton explained that the object of putting THE POST in the hands of the men of his company was to keep them intelligently acquainted with general business conditions in Canada. He said he knew no better paper than THE POST for the purpose. It would seem that his men have responded fully to effort made to keep them well informed about Canadian business affairs—so much so that the management have added 40 other men to the original 10 to receive THE POST.

When Mr. Mutton was with the National Cash Register Company as its Canadian manager, he was the king of all managers in the matter of sales records. In this position he achieved a big reputation built on solid achievements. He learned salesmanship in a school where competition was of the hottest kind, and where the competitors were brilliant men. Giving Mr. Mutton full credit for superior personal qualities and energy of the most ardent kind, it is taking nothing away from him when it is said that not a little of his success was due to his intimate and sympathetic knowledge of the other man's business. And he taught the men associated with him as salesmen to know the point of view and requirements of the men they called on to sell machines to.

As vice-president and general manager of the International Business Machines Company, Mr. Mutton is putting into operation an idea used by him in past days with brilliant results—he is causing his salesmen to know the business and requirements of their prospective customers. To establish points of contact swiftly and surely is one of the open secrets of successful selling.

In the case of **your** solicitations of customers and desired customers, it is excellent strategy to have your salesmen so well informed about business conditions generally, and about the interests of the men they canvass, that they will be able almost instantly to relate their proposals to the interests of the buyer. When a salesman shows himself intimate with the interests or business or objectives of the man whose order he wants, he is immensely strengthened as a salesman, and his percentage of successful canvasses goes steadily up.

Our definite suggestion to you is: Subscribe to THE POST yourself, and learn from its pages how your salesmen or executives can draw power from this newspaper. Then, having acquired the sought-for knowledge, subscribe to THE POST for each man in your service who can profit you by knowing what is in THE POST each week. If Frank Mutton and other prominent executives are making a success of THE POST as a salesman's aid, it is reasonable to suppose that other managers of salesmen and executives can likewise employ THE POST as a producing agent. And so we ask you to sign and forward the coupon below.

The MacLean Publishing Company, Limited,
Dept. S.E., 143-153 University Ave., Toronto.

Send me us THE FINANCIAL POST OF CANADA (weekly). Subscription price of $3 will be remitted on receipt of invoice in the usual way. Have this copy sent to

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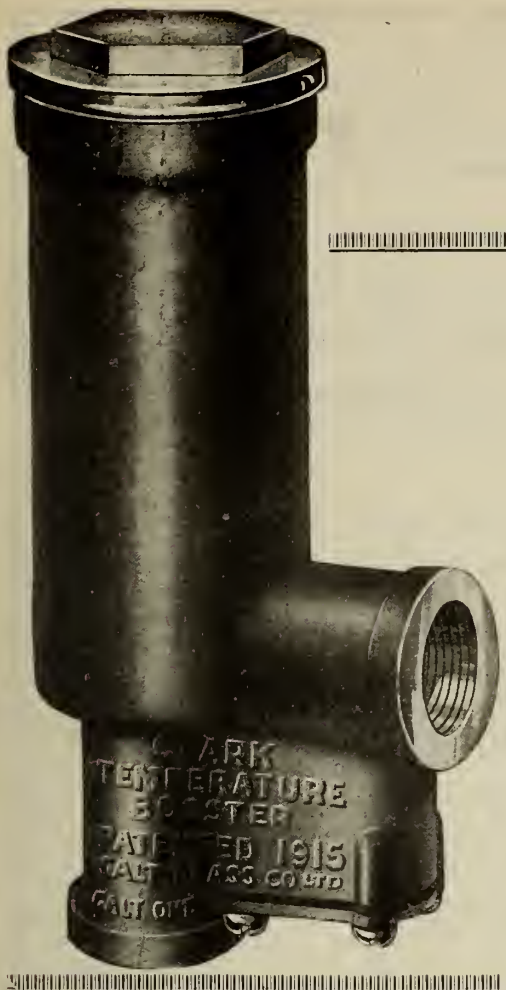


The Function of this is to increase circulation and save fuel . . . . . It helps you to make more money by building up your business . . .

Clark Temperature Booster

is designed to help those who heat their buildings by hot water. The primary function of it is to increase heat and thereby save fuel. If your customers complain of their heating system, and you go to investigate, you find that while some radiators are hot, the remainder are cold. A Clark Temperature Booster will cure the trouble.

You Recommend Clark's Temperature Booster.

Write Us or Write Your Jobber

GALT BRASS CO., LIMITED

GALT, CANADA

For the Plumber—

The period of readjustment after the War, about which so many people are talking, presents to the Sanitary Engineer greater opportunities to develop new business.

During the War many homes have been neglected and the Plumbing particularly has fallen into disrepair. It would be quite conservative to say that at least twenty thousand houses in Canada require new Bathrooms.

Now is the time to get after this business. It's a selling preposition and Bathrooms can, and should be, sold in just the same way as any other commodity.

Prospective customers should be circularized and furnished with new and up-to-date literature, explaining the advantages and benefits of good plumbing, and the householder should understand that there's no room in the house more attractive than a good bathroom, and know that nothing adds greater value to a house as a selling proposition.

The Sanitary Engineer can make this plain to his customer by advertising, by correspondence and by personal talks; and he will find his work much easier if he uses our Booklet showing "Enamelware for the Home," and uses Port Hope Enamelware in his installations.

Port Hope Sanitary Mfg. Company, Limited

Factory:
PORT HOPE, ONTARIO

Head Office:
ROYAL BANK BUILDING, TORONTO

TORONTO SHOW ROOMS
119 King St. East

WINNIPEG OFFICE
405 Tribune Bldg.

MONTREAL SHOWROOMS
234 Beaver Hall Hill

HALIFAX OFFICE: 58 Bedford Row

SANITARY ENGINEER

VOL. XIII. JANUARY 2, 1919 No. 1

Someone Should Be Held Responsible

There Should be Some Interest Taken by the Trade in Such Matters as Are Referred to in This Article—Lives Lost and Ill-health Brought About by Poor Installations

WE HAVE winter with us again, and we have all over the Dominion reports appearing in our newspapers of fatalities as the result of improperly installed heating systems. What is being done to eliminate such fatalities? Absolutely nothing. The heating trade seems to be in a state of coma. No concerted action that we can learn of is being made, and still the jerry builder and cheap-jack holds sway.

Let us review the situation again. though we have taken these matters up very fully and often during the last few years in SANITARY ENGINEER. In the first place the heating of a building has never been regarded as one of real importance. It has almost always been looked upon as a source of expense from first to last; not as a necessity that could be turned into a profitable asset, but rather in the light of a liability. Such being the case, the cutting down of first cost has been and is to-day looked upon as being the most important element in a heating system.

Now, in the first place, what class of men are the most logical and practical to explain to the public the danger in a thousand and one ways of an impractically installed heating system? The heating engineer, of course. And who are doing the least to instruct the public of the dangers that lurk in a home or building in which there is a heating system that is not fully equipped and properly suited for a building? Again we have no alternative but to admit it should be the heating engineer. Why? Because in the main he himself is not a salesman, he is the victim of the sub-contractor, the bulk contractor or the architect on the one hand, or he is often so anxious to procure the heating contract that, instead of tendering on what he knows is absolutely necessary, he merely quotes on the system specified by the class of men mentioned above.

What does all this kind of procedure amount to? or, should we say, what are the results finally? The cheapest impractical appliances are installed. If a warm-air furnace is specified, the whole apparatus very often means no more than a jumble of tin pipes, as light gauge as can be procured, a poor, miserably designed hot box of a stove in a light gauge galvanized casing and as cheap a type of wall register as can be procured.

No real engineering science is embodied in the make-up of the apparatus, no heat-controlling device, no well laid out job, and no thought as to either the heat loss of a building or precautions to ensure that the maximum amount of heat from the fuel burned is procured to really warm the house or building in which the apparatus is installed. In fact here is the state of affairs which exists in Toronto and many other large Canadian cities. Mr. Workingman builds himself a home, or he likely buys some cheap shack. He adds to it as time goes on. He uses stoves to heat this piece-meal home until he becomes convinced that he should have a warm-air furnace installed. He goes to some departmental mail order store and buys whatever is offered to him, perhaps a furnace which looks to him, standing there on the store floor, as if it was big enough to heat a town. He buys it and gets possibly a few instructions (How to install a furnace). Next, he goes to some hardware store and buys so many lengths of tine pipe, a few registers, and there he has all he wants. Little does he know that men are studying the problems of warm air heating and even to-day. with all the scientific thought expended, we venture to say that we have not by any means reached the millennium in any type of heating. Much less warm air heating.

In the city of Toronto any person can procure anything he wants in the shape of plumbing and heating goods and can install them himself, though it is against the law to install plumbing goods without a permit, etc., etc., but it is done because the goods can be procured from irresponsible mail order and department stores and no questions asked. In effect this type of store says: "What care we if these plumbing goods not being properly installed result in generating tuberculosis, pneumonia, influenza, etc., etc. Or, what care we when we sell a furnace, whether a few dozen lives are lost as a result of improperly installed heating appliances. Neither do we care how much fuel is wasted. It's none of our business, we are here to make money. We are in business to sell goods."

In fact, selling such goods under present methods is about on a par with the doctor who prescribes a certain mixture of medicine, and forgets or neglects to state at what intervals the medicine is to be taken. Of course no doctor ever lived who would do such a thing. But that is just what is being done in effect by persons or institutions who sell furnaces, or plumbing goods, and who are not held responsible for the proper installation of these appliances.

JERRY-BUILDING

Defective furnace installation caused the death of a whole family last week. Four persons were asphyxiated by coal gas. It is a wonder that fatalities of this sort are not more frequent. The hot-air system of heating has been made unpopular not because it is intrinsically inefficient, but because the contractors have insisted on low-priced work. Cheapness rather than thoroughness has been the ideal.

The art of speculative building in this city has been developed to a high point. Sheet metal workers have been expected to do a fifty-dollar job for forty dollars. As a result, a good many people are uncomfortable in severe weather, and there are too many fire alarms. If the public health demands a careful inspection of all plumbing installation, with the application of the smoke-test, why should not the city authorities set up a standard for heating installations?

—Toronto Daily News,
Dec. 26, 1918.

Next, there is the bulk and sub-contractor or architect who specifies the size and type of furnace and method of installation. Should these men be held responsible or should the heating engineer? SANITARY ENGINEER does not want to appear too arbitrary in this matter. But we would assert very strongly that the heating engineer should by all means be held responsible. He is the practical man on the job, and he should be the judge. Long after the architect or contractors are forgotten, the name of the heating engineer or the manufacturer of the appliances installed is remembered and commended or condemned according to the merits of the installation.

Who was it improperly installed furnaces in homes owing to which lives have been lost? We refer to any or all. Where is the jury, or was there a proper and practical inquest held in connection with the deaths of all the persons who have lost their lives within the last, say ten years? There should be practical heating engineers on such a jury. Men who could give a proper verdict. Some one should be made responsible. There is honor and service in responsibility, and we heating engineers should wake up and grasp this responsibility. We would then cease to be the tools of every Tom, Dick, and Harry of a contractor or architect. In fact, the influence which, because of our practical knowledge, we could bring to bear upon the public's mind would be enormous if we would only assert ourselves more prominently.

Cause for Alarm

There is a big movement on foot to assist workingmen to build homes for themselves, or to house our returned soldiers. What is going to be the outcome of this scheme if practical heating systems are not installed in these homes? These homes are going to be wasting hundreds of thousands of tons of fuel. These homes are going to be generators of every disease known to humanity, and who pays? The workingman, the soldier and their babies. These homes will be a liability instead of an asset. And particularly so if these homes are erected in the same manner as is being followed by the housing commissions in the United States. But as this is another story, the writer will not dwell on that phase of the housing scheme of America. What SANITARY ENGINEER foresees is, that if impractical men are allowed to plan houses for our returned soldiers, for our workingmen, and there is no jurisdiction over the heating appliances, either as to the way they are installed or their efficiency in consumption of fuel, then, such appliances will be installed (as per usual): first cost only will be the chief factor, and lives will be endangered, the health of the occupants undermined and no one will be responsible.

SECURING POSITIONS FOR SOLDIERS

What the Government is Doing With and For Our Returned Soldiers—How Information is Being Secured—Able Men at the Helm—This Does Not, However, Prevent Every Citizen From Doing His or Her Share

FROM time to time SANITARY ENGINEER has been asked a number of questions re what is being done for our returned men. In this connection a short article appeared in our Dec. 15 issue, but since that date we have received a communication from the Government information bureau regarding the question, and have pleasure in publishing same in full for the benefit of our readers:

HOW DEMOBILIZATION BRANCH OF SOLDIERS' CIVIL RE-ESTABLISHMENT GETS CONTACT WITH RETURNING MEN OVERSEAS

Routine In Canada

The Demobilization Branch of the Departments of Soldiers Civil Re-Establishment is under the direction of Major L. L. Anthes with T. A. Stevenson as assistant. Major Anthes is leading manufacturer and engineering expert and was chosen as representative of manufacturing and technical interests while Mr. Stevenson as secretary of the Toronto Trades and Labor Council was chosen to represent labor interests. The Re-Establishment Department makes its first contact with the Canadian soldier while he is still overseas. Major T. W. Anderson, the overseas representative, who is already in England, is conducting a questionnaire of the members of the C.E.F., the men being required to state their occupation at the time of enlistment, the occupation they wish to follow on their return to Canada, the dispersal area which they have chosen and other necessary detailed information. This information, which will be tabulated at headquarters in Ottawa within a month, is to be used in connection with the survey of industries being conducted by representatives of the Department of Labor. These representatives, who have technical knowledge of the industries which they are assigned to survey, will periodically collect data regarding positions actually vacant and liable to be vacant.

The man and the job will be connected at the demobilization employment offices which are now being established throughout Canada at every military dispersal centre and in every city of 10,000 population and over.

Under Provincial Control

These offices will be under the control of the Provincial Departments of Labor, but are being organized and co-ordinated by the Dominion Department of Labor. There is a safe and sure system of directing the returned soldier to these employment offices and of seeing to it that he gets preference in employment. The Provincial Returned Soldier Commission whose organizations have been built up on a very extensive scale during the past four years will be charged with the work of befriending the soldier and of directing him to the employment office. At the employment office there will be a representative of the Department of Soldiers' Civil Re-establishment whose duty it will be to look after the soldiers' interest when they arrive at the office. This representative, it is proposed, will make his reports through the Returned Soldiers' Commission to the Department's headquarters in Ottawa. In each unit there will be at unit headquarters a demobilization officer of the Department of Soldiers' Civil Re-establishment who will also be a member of the Returned Soldier Commission, and who will act in an advisory capacity. All of the employees mentioned are to be returned soldiers and it has been promised that as far as possible the men in charge of the demobilization employment offices will also be returned men.

The Department of Soldiers' Civil Re-Establishment is acting in co-operation with the Department of Labor and several other departments of the Government, under the co-ordinating direction of the Repatriation and Employment Committee, which has been established for the purpose of securing the most efficient service and eliminating duplication by Dominion or Provincial departments and organizations, without dispensing with the services and connections that have been established for three years or more and that have done such efficient work.

By Vocational Branch

The return of the disabled soldier to civil life will be accomplished as it has heretofore through the vocational branch of the Department of Soldiers' Civil Re-Establishment. The man so disabled by war that he cannot return to his former employment will be given training in a suitable trade or occupation and will receive vocational pay and allowances.

The medical service continues free: sanatorium, hospital and outpatient treatment. Every man of the Canadian Expeditionary Force honorably discharged is entitled to free treatment for recurrence of war disability as long as he lives. The service of the branch supplying and maintaining artificial limbs and appliances free of charge is also continued. That there is still a large task ahead for these branches is shown by the fact that there are still over 30,000 wounded and disabled men to be returned to Canada, many of whom will require vocational training and still more medical treatment.

A Chat About Cleanouts

No Doubt the Troubles With Cleanouts Are Countless—Every Sanitary Engineer Will Agree With Many Points Taken Up in This Article By the Writer

By a TROUBLES MAN

NEARLY three years ago I had the privilege of addressing the readers of this journal in two small articles on cleanouts, and having had this subject further strongly impressed upon me in various ways since that time I would like to present some further views on this important subject.

Now the object of affixing cleanouts is to permit of the removal of obstructions from the soil, waste and drain pipes without breaking into those conductors, and the cleanouts should be affixed in such a manner that this object can be readily attained.

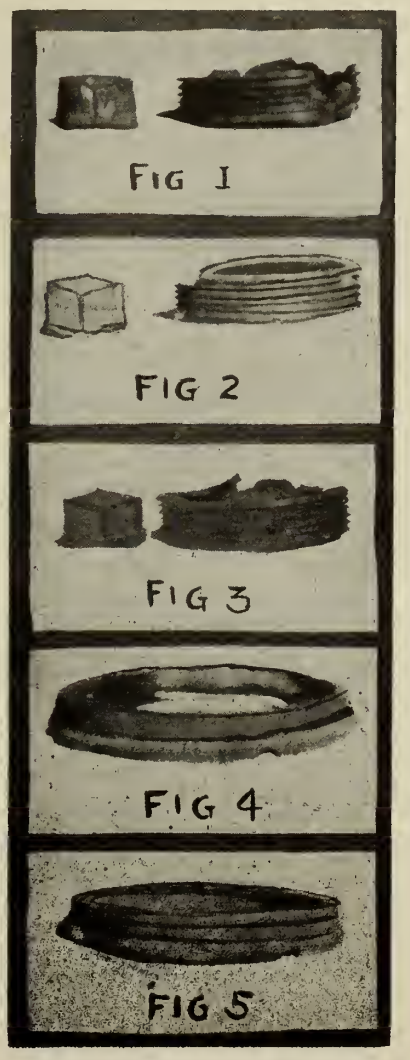
Most plumbing regulations and by-laws require that cleanouts shall be placed at dead ends of waste and drain pipes at each change of direction, and where the house drain enters the premises, also just above the foot of vertical stacks. Some laws state, in addition, that they shall be placed at intervals not exceeding 50, 40 or even 25 feet apart on straight runs of horizontal pipes.

Most regulations insist that "cleanouts shall be constructed in such a way that easy access can be gained to them," yet what do we find? It seems to me that three words are needed to be affixed to the end of that clause, these words being "at all times."

Often when the plumber has fixed a cleanout in what appears at the time of installation to be a suitable accessible location, the mason, the carpenter, or the owner comes along, and puts up a partition wall for, say, a coal bin in the basement, just two inches behind the cleanout of the sink waste, and the plumber may have to break a hole in the wall a foot square to get even a small wrench on the cleanout nut, before he can remove a chokage. Of course, one often meets a cleanout placed so close to a permanent outside wall by the plumber, but they have usually been so put before the institution of plumbing inspection, or under a lax or impractical inspector.

The writer has discovered many cleanouts, some quite recently, that have been concreted over and otherwise covered up. This state of things may have been the plumber's fault through fixing them too low, though it was possibly the building superintendent's error in giving him the floor level, but certainly the floor-layer was at fault in covering them over instead of having them brought up to surface, forming a box, or dishing the floor to take care of them.

The evils of the two latter plans, which make them so undesirable, are that they retain any foul or stale liquid that may and invariably does get into them, and that they get filled up with dust and get lost, causing them often to be covered over by temporary bulky obstructions or permanent partitions, or bricked walls. It would be a good thing if the plumber would leave a note with the building superintendent, or the owner, or both, calling his attention to these things; it would greatly add to the convenience of the occupier of the premises and show an intelligent interest on the part of the plumber in the successful working of his installation. "But," the plumber says, "it's up to the inspector." Perhaps it is, but how many plumbing inspection departments are sufficiently staffed to permit of the inspector tagging all the cleanouts on a job, or of doing anything beyond noting the fixtures and ascertaining the tightness of the work on his two hurried visits of inspection? And so when a chokage occurs the owner has to part with his good dollars to unearth, or what is much more expensive, unconcrete these lost cleanouts.



Then, again, forming boxes in the concrete for cleanouts comes in very unhandy for the man who has to open the cleanout, especially when it has a central nut, as the only wrench that will operate at right angles to the axis is too short to exert the necessary force to induce the glutted threads to part company.

Speaking of glutted threads, the writer has quite a collection of nuts that have been torn off cleanout plugs of a similar pattern to that some time ago adopted by the Winnipeg branch of the C. I. S. E., though he has found many others that have been easy of removal owing to the body having been split by the forcing of the plug into place in the endeavor to achieve the impossible, by making staunch the entry of the continuous thread into another continuous thread.

Still all these troubles fade into significance by comparison with the removing of cleanout plugs from Durham tees and "Y's," etc.

Where the "T Y" finishes the horizontal portion of a sink waste or other waste pipe it is usually put on at the bench; the vise holds the pipe and the plumber has a good chance to screw the plug right home, and he usually does it. A notable case of this kind recurs to me. In a hotel a bar back fixture with a cornice three feet wide was placed beneath it, the top being about a foot below the T. Y. It got choked in the horizontal run and it took a plumber nearly a day to cut that plug out of the tee with a diamond point which was the only tool he could bring to bear on that particular plug after a stillson had chewed off the nut.

It is often necessary to crack the tee or Y to remove these plugs, which do not require many months to rust together, and it is my contention that proper cleanouts for Durham work are badly needed and should in all cases be insisted on if Durham work is to be installed.

Good cleanouts for Durham work are more necessary than for cast iron systems, owing to the greater frequency of chokage.

Fig. 1 is a photograph of a main cleanout plug removed from a flooded basement. The water drained away when the nut tore out. The reader will note the body was not cracked in this case

Continued on page 32.

Building Not Yet Very Active

A Number of Larger Cities Lead in the Building Industry—With the Gradual Steadying Down of War Activities and More Stable Conditions in Labor Circles, the Building Trade Must Come Back to Normal

In spite of declarations that the building industry has experienced a marked revival since the signing of the armistice, very little improvement is indicated by the figures of building permits issued by Canadian cities during November. Thirty-five cities, as exhibited in the table below, reported the issuance of permits to the value of $2,206,282. This compares with $2,049,280 in November, 1917, an increase of $157,002. Of course, the statement that building is reviving is not necessarily incompatible with low permit figures. The reported activity in building doubtless has reference to the preparation of plans, the letting of contracts, etc., and no effect on permits may be expected for a month or two. In fact it may not be until next spring that permits will actually reflect the changed conditions.

Cities That Lead

Toronto takes precedence as the city reporting the largest amount of permits for the month. Its figure was $396,385. Next comes Hamilton with $374,385; then Montreal with $339,475 and Halifax with $326,907. The best showing so far as gain is concerned is made by Halifax, where the increase amounted to $291,699. Hamilton's gain amounted to $220,925, and that of Montreal to $120,120. On the other hand Toronto was behind by $21,734. The poorest showing was made by Quebec, where this year's permits of $69,056 were behind by $426,895. Altogether the 23 eastern cities reporting broke about even with last year, having a gain of only $140,948.

November permits in the West have been very small though apparently not unusually so. Twelve cities reported aggregate permits of $265,579, an increase of about $16,000. Vancouver was in the lead with $70,798, a gain of $35,723. Winnipeg came second with $43,050, a decline of $3,550.

For Eleven Months

As the year approaches its end, it is apparent that on the whole the building situation has enjoyed a substantial improvement. This is clearly indicated by the eleven months' experience. For 35 cities the total has been $35,185,263, which is an increase of $3,771,202. Much of this good showing, it must be admitted, is due to the performance of the Western cities. With the sole exceptions of Brandon and Winnipeg, every important Western city has enjoyed a gain. In the case of Vancouver this gain was as much as $646,771, while in that of Calgary it was $631,400 and in that of Regina, $576,280.

However, the East is also ahead, though not to the same extent. Twenty-three cities show a gain of a million and a half. Most noteworthy, of course, is Halifax, where reconstruction has called for buildings worth $2,783,465, an increase of nearly two millions. Toronto has the largest total, viz., $7,929,880, which represents a gain of well over a million. Ottawa has a gain of $1,531,637, while Quebec is behind by almost a like amount. Montreal with a total of $4,706,828 has an increase of $407,775. Other figures indicate a good deal of variety.

RAISE RESTRICTIONS

To Permit of Erection of Three-Family Apartment Houses

Toronto's Board of Control has recommended to the city council that the residential restrictions in the district between Parliament and Bathurst streets, south of Carlton and College Streets, be relaxed to permit the erection of three-family apartment houses and the conversion of existing buildings into three-family apartments.

This proposal made originally by Controller O'Neill was debated in council some months ago and left in abeyance pending the report of the Housing Commission, which was tabled at the last meeting of council. The Controller again moved his resolution, which was to include the central area as far north as Bloor Street.

Building Permits for the Month of November

	Nov., 1918	Nov., 1917	Change	11 mos., 1918	11 mos., 1917	Change
Eastern Cities						
Maritimes—						
Halifax	$ 326,907	$ 35,208	+ $ 291,699	$ 2,783,465	$ 831,152	+ $1,952,313
St. John	2,500	17,100	— 14,600	351,323	529,750	— 178,427
Sydney	18,690	46,165	— 27,475	397,897	405,765	— 7,868
Quebec—						
Montreal	339,475	219,355	+ $ 120,120	$ 4,706,828	$ 4,299,053	+ $ 407,775
Quebec	69,050	495,945	— 426,895	898,791	2,449,986	— 1,551,195
Westmount	7,250	1,500	+ 5,750	270,061	137,990	+ 132,071
Ontario—						
Brantford	129,945	25,335	+ $ 104,610	$ 759,935	$ 137,280	+ $ 622,655
Chatham	21,700	6,625	+ 15,075	153,890	356,897	— 203,007
Fort William	525	11,500	— 10,975	481,350	657,415	— 176,065
Hamilton	374,385	153,460	+ 220,925	2,162,854	2,478,810	— 315,956
Kingston	18,355	4,247	+ 14,108	310,395	141,098	+ 169,297
Kitchener	1,265	11,765	— 10,500	235,662	205,352	+ 30,310
London	110,690	85,110	+ 25,580	848,680	803,300	+ 45,380
Ottawa	41,600	104,200	— 62,600	2,561,554	1,029,917	+ 1,531,637
Peterborough	2,532	7,235	— 4,703	238,076	953,168	— 715,092
Port Arthur	3,240	5,973	— 2,733	605,806	1,342,434	— 736,628
Stratford	1,125	6,060	— 4,935	89,751	215,548	— 125,797
St. Thomas	9,025	2,400	+ 6,625	54,310	79,120	— 24,810
St. Catharines	13,319	56,448	— 43,129	450,322	514,553	— 64,231
Toronto	396,385	418,119	— 21,734	7,929,880	6,793,198	+ 1,136,682
Welland	9,300	14,150	— 4,850	427,304	240,334	+ 186,970
Windsor	42,800	71,405	— 28,605	533,470	1,156,790	— 623,320
Woodstock	640	450	+ 190	115,938	90,985	+ 24,953
Total 23 E. Cities	$1,940,703	$1,799,755	+ $ 140,948	$27,367,542	$25,849,895	+ $1,517,647
Western Cities						
Manitoba—						
Brandon	$ 15,546	$ 2,400	+ $ 13,146	$ 97,222	$ 180,338	— $ 83,116
Winnipeg	43,050	46,600	— 3,550	2,030,800	2,202,850	— 172,050
St. Boniface	11,000	660	+ 10,340	264,115	70,925	+ 193,190
Alberta—						
Calgary	42,500	27,700	+ $ 14,800	$ 1,169,500	$ 538,100	+ $ 631,400
Edmonton	18,600	5,600	+ 13,000	334,600	309,800	+ 24,800
Lethbridge	4,620	13,930	— 9,310	135,553	94,628	+ 40,925
Saskatchewan—						
Moose Jaw	3,200	33,950	— $ 30,750	$ 519,695	$ 294,660	+ 225,035
Regina	32,950	13,240	+ 19,710	985,690	409,410	+ 576,280
Saskatoon	8,350	62,100	— 53,750	595,665	578,005	+ 17,660
British Columbia—						
Vancouver	70,798	35,075	+ $ 35,723	$ 1,358,731	$ 711,960	+ 646,771
Victoria	11,165	3,720	+ 7,445	229,290	93,575	+ 135,715
New Westminster	3,800	4,550	— 750	96,860	79,915	+ 16,945
Total 12 W. Cities	$ 265,579	$ 249,525	+ $ 16,054	$ 7,817,721	$ 5,564,166	$2,253,555
Gr. Total 35 Cities	$2,206,282	$2,049,280	+ $ 157,002	$35,185,263	$31,414,061	+ $3,771,202

Sanitary Engineers to Prevent Disease

The Part They Play—Greater Portion of Diseases Are Preventable—Engineers Could Eliminate Many, if Consulted and Their Advice Followed—Cleanliness, the Greatest Disease Preventive, is Mostly a Matter of Sanitary Engineering

By a Sanitary Engineer

IN looking for the causes of the present epidemic of influenza the sanitary condition of the country should be considered in relation to the prevalence of sickness. If the situation is regarded as a whole, it will be seen, first, that all constructional works for sewerage and water supply were stopped at the beginning of the war; next, that the medical officers, district engineers, and in fact all workers connected with the maintenance of the sanitary condition of the country were drawn upon in very large numbers for military service; and, third, that material of all kinds necessary for maintenance became more and more difficult to obtain. Thus, even if other things had remained normal, those who had the control of works upon which the maintenance of proper health conditions depends were severely handicapped.

This, however, was only the beginning of the trouble. Large camps and munition works were hurriedly established all over the country, and working conditions in towns and villages were entirely upset by an unexpected increase in the population through the presence of bodies of troops and other causes. Even if the Government Department had consulted the best sanitary engineers it would have been a most difficult matter to prevent the setting up of insanitary conditions; but it is a matter of common knowledge that a great deal of work has been badly done, and that, speaking generally, very little use has been made by the Government of the services of engineers. The American Government, as soon as they came into the war, retained the services of the very best civil engineers to look after the sanitation of their cantonments, with the good results which were to have been expected. Other factors that have tended to lower the sanitary condition of the country as a whole have been the presence of many thousands of prisoners and foreign refugees, the erection of a great number of establishments, large and small, at some of which the insanitary conditions are absolutely vile, and the crowding of villages and towns with sick and wounded from the war. If there is any truth in the idea that disease may be produced by insanitary conditions, the marvel is that we have hitherto escaped an epidemic infinitely worse than the present visitation.

Need For Expert Advice

If cleanliness is a preventive of disease, the sanitary engineer should have much more to do at present than is commonly supposed. Books are published which suggest to the layman that he may become his own lawyer, but it is quite unnecessary for anyone to write a book with the title "Every man his own engineer," because upon that subject most men esteem themselves fully qualified to express an opinion and sometimes actually to carry out work. Thus, if the water supply or sewerage of a district is in question, it is by no means certain, apart from places possessing a competent engineer with sufficient time for his work, that anyone possessing really expert knowledge will be called upon to deal with the matter; and, further, it is practically certain in the majority of cases that the work having once been installed will receive no expert attention at all; that is to say, expert attention in the true meaning of the word. Sewers which were designed to suit particular conditions are used for an indefinite period until they become quite insufficient for the needs of the place, and during this time all sorts of unqualifed persons are allowed to connect their drains with a very limited amount of supervision on the part of the local authority. The result is that a good sewer is frequently ruined, large quantities of land water are allowed to enter the system through leaking joints in such connections, and, in short, the original design of the engineer is entirely spoiled. Sewage disposal works in particular are often worked beyond their power, having been put in to serve a much smaller population.

Importance of Maintenance

Conditions of this kind exist in a large number of cases, but are by no means the worst part of the trouble, and probably not the chief cause of ill-health. There can be no doubt that the ordinary condition of the drainage of houses, of the soil and waste pipes and of sanitary fittings is extremely bad, especially with regard to their maintenance. The writer during the past 25 years has inspected a very large number of buildings of various kinds, houses, business establishments, hospitals, works, and so forth, and has generally found that even where the systems are well designed and well constructed very insanitary conditions have been set up owing to ignorance and neglect of proper cleaning. In many cases although the drains may be sound they are not kept clean. The interceptors are frequently found to be blocked, wholly or partially, causing the drains to stand full of sewage, which escapes at any leak instead of flowing into the sewer; the ventilation pipes from the drains often terminate close to the tops of chimneys, whence the bad air may be drawn by a down draught into the houses; the fittings are not properly cleaned; baths and basins, though properly trapped, nevertheless have overflow pipes which are so foul that they produce dangerous smells. The importance of trapping the waste pipe of a sink was realized long ago, and if the sink is trapped the average person looks upon the whole matter as settled. But attached to many sinks will be found an overflow pipe, ventilating freely into the house and coated with decaying soap or grease, the smell from which may be quite as dangerous as that from a waste pipe, and similar results may be produced by accumulations of grease under lead or woodwork round a sink or under draining boards. It is scarcely too much to say that there are few places where, owing to ignorance of the need for scrupulous cleanliness and proper maintenance, insanitary conditions are not set up inside ordinary houses.

Attention to Details

Defects of this kind have no doubt a great effect on the health of the community at large. An instance of the result of scrupulous cleanliness and scientific maintenance of the drainage system of certain London business premises was given recently, and the consequent prevention of influenza was noted. Further, the health generally during the past four years has been very good, although formerly, before the present changes were made, there were many cases of sickness. It is reasonable to suppose, therefore, that the management of the business in question have actually reaped a considerable financial benefit by adopting the unusual course of having expert advice upon what would ordinarily be regarded as a purely domestic matter, in fact a matter really beneath the notice of the heads of the establishment, and one to be dealt with by servants and cleaners. It is certain that the latter, even with the best intentions, would miss many important points, and even an experienced builder or plumber, being quite unused to the high standard of cleanliness enforced, would be unlikely to give proper directions.

If attention to small details within the house can give such influence on health as is indicated by this example, there are numbers of points of still greater importance in connection with sanitary engineering and water supply taken as a whole. Who can say, for instance, what harm is done by the mil-

lions of flies which congregate on a sludge heap at the sewage disposal works or on the filters? Who can say what harm is done by an occasional back-flow of sewage into a cellar in a building which is apparently well drained, such a back-flow never being discovered by those who are living in the rooms above? Who can say what harm is done by a sewer leaking near a water main which possesses an unsound joint or pipe. Water mains are sometimes empty, a vacuum is formed, sewage standing in the ground may be drawn in, and the purest of waters may be thus contaminated without detection.

Factors Adverse to Good Work

Sanitary engineering is not yet regarded in its proper light, and even the best sanitary engineers hesitate to produce the perfect scheme they know to be possible or to suggest the amount of expert attention required, knowing full well that the cost of such work is always cut down to the irreducible minimum. The work is not seen, and therefore it is practically impossible to obtain the money needed to do it in the best possible way. While it is undesirable to spend money unnecessarily, while extravagance in municipal works is a thing to be avoided, the great importance of sanitary engineering ought to be brought prominently forward, and the position of the sanitary engineer, that is to say of the properly qualified engineer who has made sanitary engineering his life work, ought to be understood as clearly as the position of the medical specialist. The Institution of Sanitary Engineers was founded with this object and has already done much good work, but the public needs to be educated upon this point, which is certainly vital to the health of the nation. Engineers are as much in need of enlightenment as the general public, for it is by no means unknown for a man who is an expert on some other subject to think that he can very easily deal with what is, in his opinion, such a simple matter as drainage, little grasping the fact that it is one of the most complicated and difficult branches of engineering.

Value For Money

The idea that money may be wasted upon water works and upon drainage and sanitary work is quite sound; not only may it be wasted, but very frequently is wasted, because work put in by an incompetent person is generally not only ineffective but also wasteful. Where, however, good work and proper supervision will prevent disease their value to the community can be proved in pounds, shillings and pence.

We have reached a certain stage of efficiency with regard to sanitary matters in this country. Things are very much better than they were a hundred years ago, and people are ready to imagine that we have reached finality. This is not the case. Sanitary engineering is in exactly the same condition as preventive medicine; an enormous amount of work yet remains to be done, and is well worth doing. If the expense caused, say, by one case of typhoid fever which does not end fatally is considered, together with the amount of energy absorbed in those who have to deal with such a case, the value of its prevention becomes apparent and may actually be to some extent estimated in money; but the cost of cases which terminate fatally cannot possibly be estimated. If those who oppose sanitary reform would consider the possibility of the prevention of illness or death in their own circle or family and would grasp the fact that good sanitary enginering actually does prevent disease, their opposition would surely be silenced. This is not special pleading for the carrying out of any work that is not strictly and absolutely necessary in the public welfare; any work which can be shown to be unnecessary should certainly not be undertaken. On the other hand, it is special pleading that the matter should receive the closest consideration of those who are best qualified to judge. Medical and scientific criticism will be welcomed by the sanitary engineer, because it is merely for lack of such attention that he has hitherto in some degree failed to make good his position and to carry out the best possible work.

HOW ONE FIRM MAINTAINED BIG STAFF IN WAR YEARS

It is a relief to have heard one plumber and steamfitter say, within the past few days, that as far as his firm was concerned they had no complaint to make of the volume of business which they had been able to secure during the period of the war. In fact they had kept their staff of some ninety men going all the time, and in doing this they reached out for all the business they were able to execute. It was refreshing indeed when SANITARY ENGINEER asked a question as to the outlook for the trade in one of the largest cities of the Dominion to receive the answer that business had been good all along. It was, indeed, an unusual reply.

How It Was Done

That this statement could be made was the result of the mangement. The owner had a big staff. They had to keep busy if progress was to be maintained. Wages were gradually advancing. Competition was keen. Better offers were likely to reach the men from various sources; the returns to be had from munition making and the like, and from the big railway companies and so on being very tempting at times. But this firm was on the job and went after trade with a will. That it paid them well to do things on a big scale goes without saying.

"We handle contracts not only in the city but we go outside also. Towns and cities many miles away have furnished us with work and our men have worked east and west of Montreal. Much of the work has been done for large institutions, and this has meant the execution of big contracts for various public and private blocks.

A Careful Plan This

"One of the plans we follow is that of going to the man who has asked us to figure on his work or who may already have given us a contract, and explaining to him carefully and fully just how we will undertake the work. In doing this we give him good reasons and full explanations as to why we propose to do the work in a certain way. It is our business to have a clear and definite plan before the work is started. To explain this to the owner is a wise thing and prevents misunderstandings later. Once an agreement is made the work is started and there are few delays, because the men know well ahead of time just what they shall be required to do. That this has proven to be a good thing goes without saying. It saves time and therefore it saves money and pleases the man for whom we are working."

Why Not You Too?

Organization, directness and eternal vigilance coupled with hard work have made many a small firm a larger one. It is very safe to say that more of the big firms of to-day have had small and humble beginnings than those which have been launched with large sums of ready cash to maintain them. Yea, a great lot of them.

It is mighty important that the small plumber and steamfitter of to-day do the little job well. It is equally important that he take the opportunity that awaits him and make the most of it. To become well-known as a thorough-going mechanic is something which is within the reach of every well-meaning plumber or steamfiter. Slipshod methods have not worked before the war and they will not work now. It's pretty much up to the mechanic to make his customers and his prospective customers sit up and take notice. If he do the small job well to-day, he is just fitting himself the better for the larger contract work of to-morrow. First knowledge and then a determined desire to succeed, coupled with faith in oneself will take you through the difficult paths and land you among the big ones.

The time is upon us when competition will again increase. The same old story, however, "the survival of the fittest," will again repeat itself. Can you plan this way and build to become a big one?

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VOL. XIII. JANUARY 2, 1919 No. 1

SANITARY ENGINEERS AND DISEASE PREVENTION

ON another page there appears an article under the above heading, and we desire to call our readers' attention to it, particularly as it deals with a subject of importance to every sanitary and heating engineer.

The writer of the article draws out some splendid arguments in favor of competency in sanitary engineering construction, competency of those men engaged in the profession of sanitary engineers.

He also points out in very emphatic language that sanitary engineers are a body of men engaged in a disease-preventing occupation. He points out the responsibility, too, of the sanitary engineer. In essence he condemns the present style of overflows. In this regard he says:—"Often fittings are not properly cleaned; baths and basins, though properly trapped, nevertheless have overflow pipes which are so foul that they produce dangerous smells. The importance of trapping the waste pipes of a sink was realized long ago, and if the sink is trapped, the average person looks upon the whole matter as settled. But attached to many fixtures will be found an overflow pipe ventilating freely into the house and coated with decaying soap or grease, the smell from which may be quite as dangerous as that from a waste pipe."

There is much to be said in condemnation of the overflow—it is an abortion and by no means should we sanitary engineers allow it to be used. In fact, the day when members of our craft took upon themselves the title of Sanitary Engineers made it imperative that they eliminate every style or type of fixture that could not be properly kept clean, or that contained any cavities to which refuse could adhere.

In connection with leaking pipes, the writer of the article mentioned takes great exception to the way an irresponsible person is in many districts allowed to make house drain connections to a public sewer. We might state that this article comes from England and contains quite a number of items of conditions that prevail on this continent. We will publish an article in next issue along the same lines showing how the American War Trade Board not only ignored all semblance of sanitary construction, but practically told the sanitary engineering profession to forget all about sanitation.

A BIG ISSUE COMING

THERE are so many questions of special interest just now in connection with the reorganization or reconstruction period, or whatever we may term it, that SANITARY ENGINEER feels justified in getting out a big issue. This will be published on Jan. 15, 1919. There will appear in that issue many specially compiled articles, all of which will have a bearing upon the work which must be undertaken by every Canadian citizen, each in his own sphere of occupation.

The questions of most interest to sanitary engineers should be, the housing scheme standardization of material, and a uniform plumbing by-law. There should also be a heating by-law put into force before all the buildings that are required to be erected are finished. A week or two ago four lives were lost as a direct result,, we are told, of a poorly installed furnace. Almost every Canadian city has had its victims from such causes and still there is nothing done. This matter will receive special mention in our big issue.

The question of irresponsible persons selling plumbing goods to be installed by impractical persons will be discussed. SANITARY ENGINEER is of the opinion that the time is ripe when the trade should take a firm stand in this matter. We believe that more preventable diseases are generated by water pollution, air pollution, etc., as a direct result of persons who presume to be able and capable of doing such work as installing plumbing and heating in their houses.

We would also say that a copy of this big issue will be mailed to every sanitary engineer in Canada, whether he is a subscriber or not, so that no member in the trade can say that he has not seen a copy, and if any of our present subscribers know of any public men who are interested in some of the problems discussed in that issue, we sincerely hope that they will bring these articles to their attention

Standardizing Plumbing Codes

Never Was the Time More Opportune Than Now—The Trade Must Wake Up and be Heard by Our Dominion Legislators—Standardization and Elimination of Needless Fittings and Fixtures Must Come

By C. W. PRESDEE

IN order to fully realize the importance of plumbing, that is, the introduction of good water and the removal of body wastes, we have but to recall the costly experience, in truth the catastrophe resulting in stupendous loss of life among our soldiers during the war of 1898, which loss was due to the lack of plumbing in the camps. One historical report of the death rate existing during past wars, states: "In the Spanish-American War, only 183 Americans were killed in battle, and 1,137 wounded, but there were 4,000 cases of typhoid, more than 10 per cent. of them fatal." In other words, more of our soldiers were killed and maimed through the disregard of sanitation than were killed or injured by the enemies' bullets. No such condition will occur now since all of the cantonment buildings both here and abroad are equipped with plumbing.

In the light of modern health conservation, the plumbing code of every municipality is given the same relative attention and is accorded the same prime importance as the factors that make for a progressive city. Very often the supervision and inspection of plumbing and house drainage installations have been extremely lax or left entirely to chance, it being necessary to only conform to a few minor regulations. This is due perhaps to the common and serious mistake of not realizing the menace to health which the lack of adequate sanitation brings into existence.

A building department would not grant a permit for an office building to be constructed of boxwood, nor should a plumbing code permit plumbing and drainage installations that are insanitary. The dangers are even greater in the latter case, for although a building so constructed is a fire trap and may burn with considerable loss to life or property, yet the insidious effect of living without proper sanitary appliances may cause a widespread epidemic throughout a whole city or community and thus create untold suffering and death. For this reason a great deal of importance must be placed upon the necessity of eliminating sewage and sewer gases, which dangerous conditions in modern city life are even of far greater importance than when existing among those who follow a free and out-of-doors life, such as our soldiers in camp.

Besides proper regard to the sanitary effectiveness of the finished plumbing, the kinds of materials used as waste piping are of great importance. Too many plumbing codes are not accomplishing what they were intended to accomplish because they permit the use of unstandardized and inferior materials. While the majority of plumbing codes regulate the weight and wall thicknesses of piping, yet they bring about a very serious fault by failing to so regulate the weights and dimensions of fittings. Permitting the use of light and frail fittings in connection with heavy piping is bad practice, for a drainage system is no more safe or sanitary than the lightest fittings which enter into its construction. All codes should, therefore, regulate the wall thickness and dimensions of fittings as well as pipe, and no undue duplication of unnecessary fittings should be allowed, but proper standards established.

Another important provision that should be included in all plumbing codes is the insisting upon proper tests which will ensure tight and permanent piping. The manufacturers of plumbing material, the jobbers and the plumbing inspectors all must thoroughly appreciate the great benefits to be derived from adopting uniform standards for sanitary plumbing installations. This widespread interest must be extended so that the layman shall as fully appreciate the necessities for federal and nationwide uniform practice in plumbing installation. Widespread publicity at this time will accomplish a great benefit in advancing sanitation.

To the officials of all cities it is of vital interest that every reasonable precaution be taken not only to eliminate unsanitary conditions surrounding our people, but the prevailing causes of health menace must likewise be prevented by insisting upon the proper installing of plumbing and house drainage which does not break down after a few months or years of service.

Leaky soil pipe may exist in a building during its whole life. It is therefore quite as important that soil pipe and fittings should be even more rigidly controlled in sanitary and building codes than is now the case with gas or water pipe or structural steel. There should be some regular periodical testing and inspecting of plumbing. Architects and owners rely entirely upon building and plumbing codes. A slight examination of actual conditions as they are to-day, even in some of the largest cities, will indicate that neither the building codes nor the city inspectors give full and adequate protection. Many codes must be revised and brought up to modern standards.

It is paramount, and especially so during these days of supreme national crisis, that every city official who has the best interests, the welfare, comfort, and health of the people and the nation at heart shall get behind this movement of progressive health officials, the engineers and manufacturers who propose to continue the unification and standardization of plumbing regulations on a nation-wide scale.

This illustrates the very common condition existing throughout sewered communities where the plumbing code does not insist upon proper house connections. Both sewers and plumbing are rendered ineffective; streets and lawns are torn up and home owners subjected to needless expense through lack of standardization of plumbing code.

What a Farmer Thinks About Plumbing

A Field Almost Untouched as Yet by Sanitary Engineers—Many Farmers Are Likely to Take Advantage of the Proposed Building Scheme—No House in Town or Country Should Be Built Without Plumbing

SOME of the suggestions made by well-meaning persons regarding the way Government money should be loaned to individuals with which to build houses are as follows: Money should be loaned to persons only who own a lot on which to build homes. Others suggest that farmers owning land should build houses for their hired help. While some go so far as to suggest that the Government should build a good house, completely fitted up with plumbing and a water supply, for every person taking up farm land, and then contend that if such a plan was adopted, Canada would procure the very cream of emigrants from all parts of the world, instead of persons taking up Canadian land, just merely fulfilling the bare conditions of the law so as to get their patent, for purely speculative purposes, and so on.

All these suggestions will no doubt bear fruit. The writer believes, however, that the farmer has as yet not been really sold as regards the full equipment of his home and outhouses with plumbing and heating appliances.

The following article from the Toronto *Globe* is an expression from the other side of the fence. The writer of the article will be remembered by those members of the Canadian Society of Domestic Sanitary Engineers who were in attendance at the convention held in London in 1916.

THE WATER SUPPLY

By Peter McArthur.

While in the city some time ago a friend complained of certain shortcomings of the farming community, and as I was unprepared for the attack I was forced to take it lying down. There was truth in everything he said, and I could not explain on the spur of the moment. He charged that the farms are scandalously lacking in such common city accommodations as running water in the house, bathtubs, and proper sanitary accommodations. I had to admit it with regret, and was inclined to agree with his assertion that it was all due to a lack of proper education along these lines. It was not until I got home and began to attend to the chores that I realized the real cause of the trouble. One of the first chores I had to attend to was to haul home some water from a neighbor's artesian well for use in the house. Our well went dry some weeks ago, like every other ordinary well in the district. While there is water in the ponds and drains that will do for the stock, the house wells have not been filled by the ordinary rains we have had. Only those who have artesian wells are properly supplied. It so happened that when hauling home the water I remembered my friend's criticisms and at once realized why we are so backward. All these improvements require an unfailing water supply, and that is something we have not got. I saw at once that his criticisms also apply to all the towns and villages where they have no public waterworks system. If he had investigated he would have found the conditions complained of among the farmers prevailing among a large section of the urban population. It all depends on the water supply.

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I am not writing this in defense of existing conditions, but with a view to finding how the difficulty may be overcome. The past few seasons have been so dry that it is becoming evident that we must do something to overcome the scarcity of water. In this district artesian water can usually be secured at a depth of from one hundred and twenty-five to one hundred and fifty feet. But the quality of the supply is uncertain. Not more than half of the wells bored yield water that is fit for use. It is often so heavily mineralized that it will not do for either human beings or live stock. I know of cases where wells within a short distance of one another differ entirely as to the quality of the water. This makes the business of boring for water so uncertain that people do not go to the expense unless absolutely compelled. It usually costs from three hundred to five hundred dollars to get a good artesian well, and farmers often spend that much without getting water that they can use. The consequence is that few of them undertake the work unless compelled to by necessity. But the disappearance of the forests and the drainage of all swamps are drying up the sources of most of the springs and surface wells, so that boring for water must be undertaken much more generally. We cannot get along without water. And when a plentiful supply has been secured there is no good reason why the improvements suggested by my friend should not be made. Those who feel that they must get artesian water in the near future should bear in mind the need of these improvements when making their calculations. It is quite true that there are farms where they have running water in the stable for the use of the live stock while the same advantages have not been provided in the house. This is probably due to the fact that the matter has not been given proper consideration. In such cases it will usually be found that the house is supplied from a surface well that has served from pioneer days. Certainly, when a proper supply of water has been secured, water that can be pumped up to the required height by a windmill or an engine, there is no good excuse to offer for not having the house equipped with modern appliances and improvements. It will mean a considerable outlay of a kind that has not yet become customary in the country, but that difficulty can easily be overcome. A proper water supply, with the improvements it will make possible, can be put in for less than it costs to get an automobile, and it will give the farm dwellers much more comfort. Farmers have learned to use automobiles and to regard the expenditure as quite legitimate. But they can use an automobile only during the season of good roads, while the water supply can be made to serve their needs and comforts throughout the year. In fact, it is in the bad weather that it will prove of the greatest advantage. The matter is certainly one that deserves careful consideration and is one that should be planned for. Now that it is becoming imperative that many wells shall be bored to secure needed water this improvement should be followed by installing modern conveniences in the farm homes. But there is also need that the towns and villages should make improvements along the same lines. Now that the question of public health is receiving the attention of Governments, we should have propaganda on the subject.

It will be seen that there is a lot of good food for thought in the above. The farmer needs the practical help and advice of the sanitary and heating engineer. He can be persuaded to buy automobiles, why not plumbing? He will even go so far as to spend $500 and more in search of a good water supply, and we venture to say that right at this very moment there are hundreds of wells that were the very best source of water supply until a cesspool was placed in their vicinity and thus the wells became polluted.

There are scores of small creeks and streams that are polluted because a septic tank and sewage disposal bed was not installed to properly take care of the sewage and domestic wastes from a plumbing system.

It can therefore be seen that not only can sanitary plumbing be sold to the average farmer, but he should be advised regarding his sewage disposal.

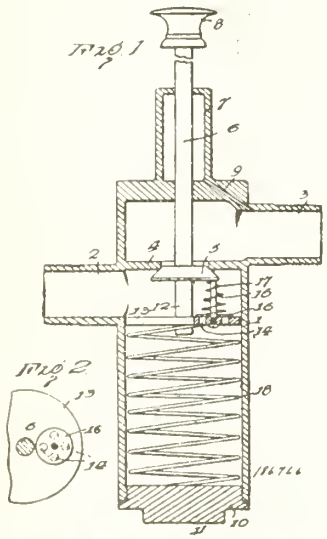
The Ontario Agricultural College is doing a great work in this connection. The writer visited this college some time ago and was astounded at the information provided for and at the disposal of the farmers of Ontario. This good work regarding sewage disposal systems for rural homes can easily be linked with an aggressive sales policy conducted by sanitary and heating engineers.

New Canadian Patents

No. 186,746

Michael J. Neary, Victoria, and Frank Greenshields, Nanaimo, assignee of a half interest, both in British Columbia, Canada, 24th September, 1918; 6 years. Filed 20th August, 1917. Receipt No. 283,478.

Claim.—In a flushing valve, a casing inlet and outlet ports formed therein, a supplemental chamber formed upon the top of said casing and having an inclined way communicating therewith and with the outlet port, said way being arranged at an angle acute to the direction of travel of water through the outlet port, a valve seat formed in the casing, a valve engageable with said seat, a valve rod passing through the valve and upwardly through the casing and supplemental chamber, a piston carried upon the lower end of the valve rod and receivable in the lower portion of said casing, a check valve arranged on the piston and an expansible coiled spring



186,746. Flushing-Valve.

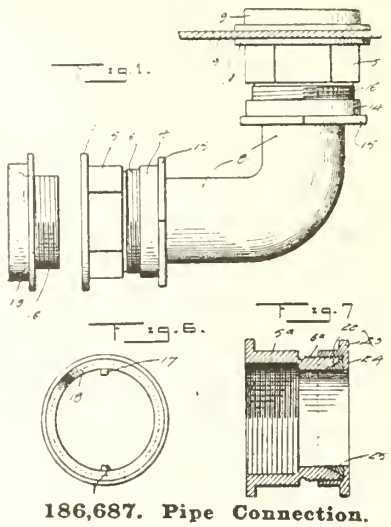
arranged in the lower portion of the valve engageable with said piston for facilitating reseating of the valve.

No. 186,687

Harry Hough, Highland Park, Michigan, U.S.A., 24th September, 1918; 6 years. Filed 15th November, 1917. Receipt No. 287,688.

Claim.—1. A pipe connection including a nut having internal screw threads, a pipe fitted in one end of the nut, an object engaging flange formed upon the nut, a sleeve fitted in the threaded terminal of the nut having a flared outer terminal, and a circular object engaging gasket confined between the flanged terminal of the nut and the flared terminal of the sleeve.

2. A pipe connection including an internally threaded nut, a pipe fitted in one end of the nut, means for securing said pipe in said nut, an object engaging flange carried by the terminal of the nut



186,687. Pipe Connection.

opposite the pipe, an internally ribbed sleeve fitted in the threaded terminal of the nut and provided with a flared outer terminal, and a circular object engaging gasket confined between the flared terminal of the sleeve and the flanged terminal of the nut.

3. A pipe connection including a main nut provided at one end with an object engaging flange and in its opposite end with a recess, the flanged end of the nut having internal screw threads and the recessed end having external screw threads, a pipe fitting in the recessed end of the nut, a gasket in said recess, a ring mounted on said recessed end and having a flange engaging said gasket, an externally threaded sleeve fitting in the flanged end of the main nut and having its outer terminal flared, a circular object engaging gasket engaging said flared terminal and ribs formed on the inner side of said sleeve.

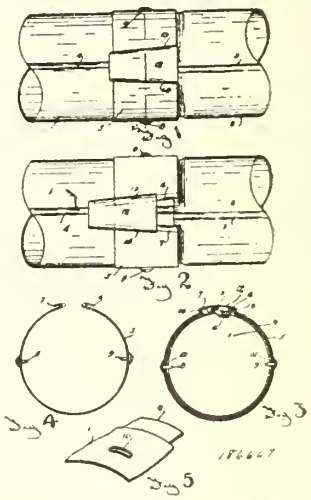
No. 186,647

Johan Walfrid Ostman, assignor, Robert Hampton, both of Winnipeg, and Gottfrid Dahlquist, Transcona, each an assignee of a fourth interest, all in Manitoba, Canada, 17th September, 1918; 6 years. Filed 9th April, 1918. Receipt No. 293,376.

Claim.—1. The combination with a pair of pipes having their ends telescoping one within the other and with the telescoping ends of the pipes provided with registering slots, of a band passing partially around the telescoped ends of the pipes, a fastener for drawing up and holding the ends of the band together, and studs extending from the band and into the registering slots.

2. As a new article of manufacture, a fastening band for telescoping pipes comprising a band having inwardly extending studs thereon, and with the ends of the band formed to provide converging hooks and a fastener provided with hooked sides adapted to slip over the hooked ends of the band.

3. The combination with a pair of pipes having their ends telescoping one within the other and with the telescoped ends of the pipes provided with registering circumferentially-directed slots, of a band pressing partially around the telescoped ends of the pipe and having the ends thereof cut at an angle and turned back to provide a pair of converging book-shaped catches, studs extending from the band and passing into the registering slots, and a tapering fastener for connecting and drawing up the ends of the band, said fastener being provided with catches designed to engage with the catches of the band.



186,647. Stovepipe Lock.

No. 186,575

Octave Fournier, St. Charles, Quebec, Canada, 17th September, 1918; 6 years. Filed 29th May, 1918. Receipt No. 295,471.

Claim.—1. In a radiator, an outer casing having an upper open end and a closed lower end provided with a central opening, water inlets and outlets in said casing, a removable head or nut adapted to be secured in said upper open end provided with a central hole, an inner tube snugly secured between said removable head and said lower closed end of said casing whereby a continuous vertical air passage is formed substantially as described.

2. In a radiator, an outer casing having an upper open end provided with an internal thread and a closed lower end provided with a central opening, and a

groove provided adjacent said central opening, water inlets and outlets in said casing, a removable threaded head or nut adapted to engage said internal thread in said upper open end of the casing, and provided with an outwardly square lug and a central hole through

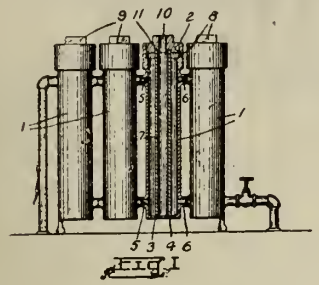


Fig. 1

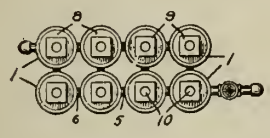


Fig. 2. 186575

No. 186,575. Radiator.

said head and lug, and adjacent said hole on the inner end of said head is provided a groove, an inner tube adapted to fit snugly in said grooves between said head and the closed lower end of said casing whereby a continuous vertical passage is formed, substantially as described.

No. 186,609

Adolord Sigouin, Ste. Agathe des Monts, Quebec, Canada, 17th September, 1918; 6 years. Filed 25th April, 1918. Receipt No. 294,171.

Claim.—In a flushing device for toilets, the combination with a receiving bowl, a tank arranged above said bowl, a flushing pipe forming a means of communication between said tank and said bowl, said flushing pipe having a curved upper end, the inlet end of said flushing

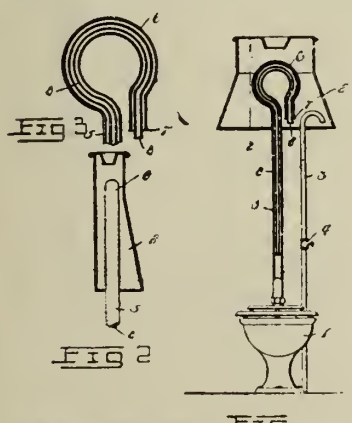


Fig 3 Fig 2

No. 186,609. Fig

Flushing Device for Closets.

pipe terminating adjacent the bottom of said tank, a siphon pipe arranged within said flushing pipe and the inlet end of said siphon pipe projecting beyond the inlet end of said flushing pipe, substantially as and for the purpose specified.

No. 186,506

William H. Shannon, Astoria, Illinois, U.S.A., 10th September, 1918; 6 year. Filed 26th April, 1918. Receipt No. 294,233.

Claim.—1. A ratchet wrench comprising a handle, a wrench head pivoted thereto, said head having a curved channel formed therein concentric with its axis of rotation, ratchet teeth provided on the head outside the channel, a spring for automatically moving the head about its axis in one direction, a toothed pawl for engagement with the ratchet teeth of the head for forcing the latter in the opposite direction, said pawl having an extension terminating in a lug entering the curved channel in the head, and a second spring bearing against the pawl for forcing the said lug against the outer wall of the curved channel to hold the head against movement by the first-named spring.

2. A ratchet wrench comprising a handle having a rotary toothed wrench

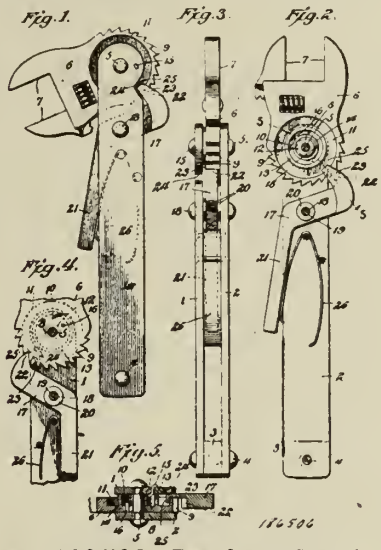


Fig.1. Fig.3. Fig.2. Fig.4. Fig.5. 186506

No. 186,506. Ratchet Wrench.

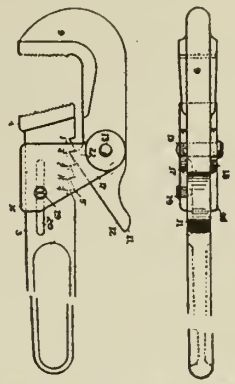
head provided with nut engaging jaws and concentric inner and outer channels formed in one face thereof about its axis of rotation, a coiled spring mounted within the inner channel and having its ends connected to the head and the handle respectively for causing the head to rotate in one direction, an arcuate series of ratchet teeth provided on the head in surrounding relation to the channels, a pawl pivotally mounted in the handle and having a tooth adapted to be manually pressed into engagement with the ratchet teeth, a lug carried by the pawl and adapted to engage against the outer wall of the outer channel in the head, and a second spring stronger than the first-named spring bearing against the pawl for maintaining the lug in such engagement.

3. A ratchet wrench comprising a handle, a wrench head pivoted thereto, a spring for automatically moving the head about its pivot in one direction, said head having ratchet teeth on its exterior, a pawl for engagement with the ratchet teeth, a spring for the pawl having a greater force than the spring for the head, and means provided on the pawl to engage the head when said pawl is out of engagement with the ratchet teeth, said means serving as a friction brake to hold the head against movement by its spring.

No. 186,487

John Reeves, Akron, Ohio, U.S.A., 10th September, 1918; 6 years. Filed 8th March, 1918. Receipt No. 291,909.

Claim.—1. A pipe wrench having a handle provided with a jaw across the end thereof and a series of saw teeth



186,487. Pipe Wrench.

on its inner edge next behind said jaw, a single yoke slidably engaged over said handle and an outer jaw having a shank at right angles to the face of the jaw thereon and pivoted in said yoke, and said shank provided with an extension behind said pivot provided with an inner straight inclined edge, and a single tooth at the inner end of said edge adapted to engage in said series of teeth, and means in said yoke in engagement with said handle adapted to limit the movement of the yoke thereon.

2. A pipe wrench as described having a handle with a fixed jaw across the end thereof and a series of teeth in the edge of said handle next behind said jaw, a yoke engaged over said handle having ears projected outward beyond the edge thereof, and an outer jaw pivoted between said ears and having a straight inclined inner edge provided with a tooth opposite said pivot adapted to engage in said series of teeth and to swing clear of the same for adjustment of the said outer jaw back and forth.

PASSED ON

We regret very much to have to report the death of R. A. Sehl, sanitary and heating engineer of Waterloo, Ontario. The late Mr. Sehl was a member of the Ontario Society of Domestic Sanitary and Heating Engineers. He was a subscriber to SANITARY ENGINEER for many years. He knew his business well, but was one of those fellows always ready and willing to learn more. Appreciating the good work of his trade society, he could always be depended upon to be in attendance at the convention.

PRACTICAL SHEET-METAL WORK

THREE PIECE ELBOW WITH GUSSET OR GORE PIECE.

BY THOMAS STANSFIELD

IN this issue we will take up the development of a round or cylindrical vessel. Before taking up the working out of its parts, it might be best to first take up a few points with regard to the method of figuring out the area and circumference of same.

To find the area of a circle multiply the square of the diameter by .7854.

Take for example a circle of 10 inches diameter. The square of 10 is 10 multiplied by 10, equals 100; .7854 multiplied by 100 equals 78.54, the area of a 10-inch circle.

To find the circumference of a circle multiply the diameter by 3.1416.

For example, take a circle 7 inches in diameter. Multiply 3.1416 by 7, which equals 21.9942 inches.

In common practice the decimal .1416 is not made use of, the faction one-seventh taking its place, thus.

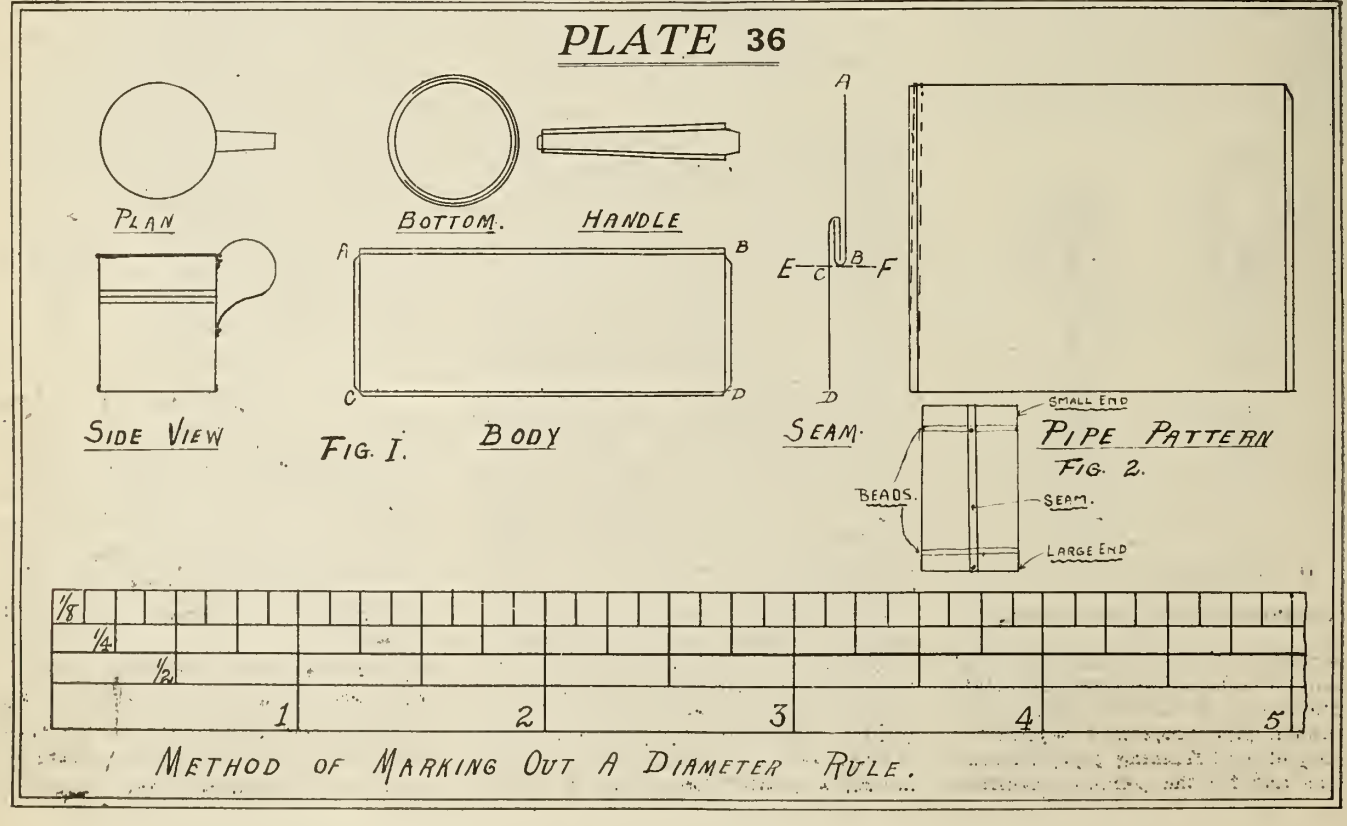
Multiply 7 inches by 3 1-7, which equals 22 inches; thus result compared to the one obtained by using the decimal shows a difference of less than one one-hundredth of one inch.

In dealing with the method of obtaining the circumference, we show an easily made rule. For this purpose it is convenient, and when made of sheet metal can be bent around most any curve, thus saving the necessity of using dividers or compasses. Its construction is simple. Take a two-inch strip of metal, half hard or springy brass preferred, and mark out as near as possible to 3 1/7 inches as many times as the length of rule is to be. Mark these spaces 1-2-3, etc., as shown, to show the circumference for 1-2 and 3, etc., inches diameter. Divide each space into halves, quarters and eighths and mark off as shown.

In Fig. 1 we show the plan and side views of a round tin dipper. With height and diameter given or drawn, first mark out and form up the body of the dipper. To mark out mark off a strip in width equal to height of article, as A-B, and C-D.

At one end, as at A-C, draw a line at right angles to A-B or C-D from A-C mark off, either by spacing with compasses, or by using a rule, the circumference of the article. If the spacing method is used, do not make the spaces too big, as by so doing a small amount of the girth is lost. If done by multiplying the diameter by 3 1-7, it works out pretty near exact, and if a diameter rule is used there is very little chance for a mistake being made. Having marked out the body, next allow the edge required for wiring at top and single edge for double seaming on bottom. The seam allowance is usually placed on each end, thus if a one-quarter inch edge is used, allow three-eighths of an inch on each end. The reason for this is shown at the drawing of a seam, the joint shown is cut at the lock by the line H-E-F, the line A-B above that line and C-D below. Make up the complete line A to D, leaving the three edges over, which

PLATE 36



METHOD OF MARKING OUT A DIAMETER RULE.

have to be allowed as described above. After forming up body, and turning edge to receive bottom, the size of blank to make same is measured for with rule and compasses.

The inner line on bottom shows size of article, the middle or incomplete line the size of edge turned out on bottom of body, and the outer line the size of blank required to seam on to body. The handle is a tapered strip with a wired allowance on both sides, the projection on either end being used to rivet on to body. The length of handle can be got by spacing, or if not marked out, by forming up narrow strip to suit, and then using as pattern for length.

At Fig. 2 is shown a pipe pattern. This needs but a small amount of time, yet quite often pipes do not fit properly. The length of the pipe is usually governed by the width of the sheet. Mark off the circumference to suit diameter required. Then mark off the seam allowances to suit folders, and at one corner mark back on the sheet the amount to be taken off to allow pipe to enter into another, as shown by dotted lines, which then forms seam allowance. In order to readily tell small end it is customary to cut a notch off that corner, and in finally completing the pipe a rivet should be placed at both ends. The small end of the pipe should have the rivet about 2 inches from extreme edge, and at the large end the rivet is placed at the edge. See sketch of pipe, Fig. 2.

(Continued in next issue.)

WILL ELECTRICITY HEAT OUR HOMES SOON

Some Very Interesting Information From Montreal—Further Improvements Being Made

VERY much has been written and much has been said regarding the practicable heating of our homes, our offices, and our large blocks and institutions through the medium of electricity. That it will be an accomplished fact is certainly credited by many. That it is possible to do it to-day from an economic standpoint is less accredited, and still there are seeming evidences of success being attained from this latter viewpoint within a very short space of time.

An Actual System

SANITARY ENGINEER was shown a system in Montreal very recently which is claimed to be the solution of the problem from all practicable viewpoints. Its inventor and patentees are very modest in their claims as to its advantages, its cost of operation, and the practical elimination of any attendant labor. Without making wild and extravagant claims, they are pursuing a course of experimentation with what they state to be undoubted success. Having carried out these experiments for a period of a year or more, and with improvements already made and others contemplated, they state that the heating of homes, business blocks and large hotels and institutions will soon be possible, through the medium of electricity, at a price much less than that now called for with any one of the several fuels in common use. The medium of heating is through voltage and not by the use of amperage.

The Patent Device

While the particulars and construction of the heating unit are essentially secret and patented fully in this country and elsewhere, a rough description can be outlined.

The little thing that does the trick, and which may be likened to a steel-encased rectangular box, contains the "element" or mixture through which the electric energy passes, and from which the water passing on through the radiators of the house or block is delivered at the desired temperature. For, be it understood, the heat may be definitely "fixed" by the operator through the simple application of more or less current. This is regulated by separate switches attached to the little "box" and which, for lack of a better term, may be called the generator-water-jacket. The one seen by SANITARY ENGINEER could not have been more than ten inches square and was so simple as to appear as an unimportant appendix of what was expected to be shown its special representative as a part of the heating unit proper. But there was nothing else, aside from the three switches attached to the service company's "juice," and here in a small space of about three feet in length and a foot diameter each way, or slightly more, was the whole system.

The Connections

Two-inch leads conducted the water from the city service to the electric generator-water-jacket, and the same size of pipe carried the heated water along to the house radiators above. At both top and bottom of the heater unions were placed and heavy gate valves, so that a quick repair might be made or the generator-heater removed within half an hour's time or less. Immediately in front of the hot water lead was placed a thermometer, and the registration could be taken on sight and the heat increased or decreased through the simple operation of one or more of the large switches. So simple did the device appear that one would have been inclined to accept it with some misgivings, were not the heat there, throughout the 24 radiators in the building, and which contained some 400 gallons of water. It was as though one looked upon a fairy scheme.

Cost to Operate

Reports have been issued as to the practicability of heating buildings with electricity, but at least one Government report has discredited the further practicability from an economic standpoint. For the system somewhat rudely described herewith this difficulty is claimed to be dissipated by the patentee and inventor. In substantiation of his claim he stated that this unit had been connected up since the 4th of November. From then to date (December 12) the consumption registered on the city meter above the heater was 1,100 kilowatts, or an average of less than 30 kilowatts per day of 24 hours. The cost, as can be readily figured, would be determined by the prevailing cost per kilowatt hour prevailing in the city, town or village where the plant was installed. Taking a price of one cent per kilowatt hour, the cost of operation for the 38 days in question would run to $11. Within the period in question all weathers had been experienced, and a considerable number of cold, windy days had been experienced.

Last winter, it was stated, a flat of seven average rooms had been heated comfortably at a very reasonable cost.

If this scheme is workable there will be nothing necessary but to turn the switch in the fall, set the automatic control, and let it go till spring.

MAKING THE OFFICE PAY

Above is the title of a new book published by A. W. Shaw Co., Chicago. It contains some of the finest examples of how an office can be made to pay.

The average business man is apt to look upon the cost of an office staff as a source of expense, a direct liability. And this may be the case in many industrial establishments. But a thorough study of this book will show the possessor that an office can be made a very valuable asset to every business. Many of the chapters contain actual experiences of big men, men who have made the office cut out lost motions and obsolete methods in the factory.

There are systems of office mangement from a one-man to a several thousand-man business shown in this book. It contains 23 chapters and nearly 400 pages of real meat.

A postal card to the publishers will procure full particulars.

It is estimated that about 2,000 men could be used in the Porcupine camp. A lumber company last week brought in two hundred men, and the mines are receiving their share.

Market Conditions and Tendencies

Statements Regarding Supplies and Trend of Prices

THE MARKETS AT A GLANCE

MOST of the thrills in the markets are those furnished by ingot metals. Lead has reached lower levels, and with the heavy stocks held in Canada some are of the opinion that even further declines can be expected. Antimony has come down materially, and whereas even lower figures may be reached, no further big drops are anticipated. Spelter has come down, copper is lower, and there seems to be some tendency towards lower prices on aluminum.

The movement towards lower levels in basic iron and steel by United States interests will in time be reflected here, it is thought. Two items which it seems may be affected to a slight extent are wrought iron pipe and soil pipe and fittings. The change is not a very substantial one, but a gradual readjustment to lower levels would seem quite probable during the year just to be ushered in. Supplies of boiler tubes are much better, and a 5 to 10 per cent. decline is mentioned as a possibility early in the new year.

Sheets and plates have held firm and unchanged at levels recently established. The present range of quotations seems to be fairly well in line with figures at the mills, and whereas some slight adjustments may be effected, no material change is contemplated.

Enamelware is firmly held. It is true declines have been recorded in the United States, but these follow recent advances made there which Canadian manufacturers did not follow. The basis ruling to-day is more nearly on a similar footing in the two countries than for some months past.

Contracts for cotton waste are being completed, and these are being filled in "subject to decline." The feeling prevails that a gradually lower scale of quotations will be in evidence, though this must be slow in coming. Restrictions on the use of wool in wool waste have been removed, and former basis for the various grades is being established.

The outlook for business is considered good, and with the opening up of spring the sanitary engineer, plumber and steamfitter should be in for a pronounced increase in business.

TORONTO, December 28.—Probably ingot metals furnish more thrills than any other item in the markets. Lead, tin, spelter and antimony have sagged still further, and conditions generally are such that it is hard to say just what the market is. Boiler tubes are coming along freely and better supplies of wrought pipe are gradually being worked out. The outlook for 1919 to which the trade are now looking is considered very bright.

Unchanged Price On Range Boilers

RANGE BOILERS.—An unchanged range of prices, a gradual improvement in supplies and prospects for good business in 1919 are the conditions ruling as the new year is ushered in. The market is steady.

	Standard	Extra Heavy
10-gallon range boilers....	$14.00	$17.00
15-gallon	17.00	20.50
40-gallon	20.50	24.00
52-gallon	28.00	32.00
60-gallon	37.00	42.00
72-gallon	45.00	50.00
100-gallon	62.00	70.00

Enamelware Steady; Prospects Bright

ENAMELWARE.—A very steady tone is noticeable in the market on enamelware. Declines have occurred in United States manufacturers' prices, but it still will be remembered that when advances occurred some time ago over there, no concerted action to follow this move was undertaken here. The result is that to-day's selling basis is not out of line with prices established following the declines recorded to the South. There may be some slight readjustments effected, and in time a gradual lowering of values in all lines may develop, but the upward move has been slow and the declines will tend to follow a similar slow movement. Manufacturers are looking forward to good business in 1919.

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Basins, flat back, 14 x 15 in.....	6 00
Do., corner, 15 in.	5 95
Sinks, roll rim, 18 x 30 in., staple.....	16 80
Closets, oak tank and seat	27 00
Do., enamel iron or white vitro tank....	29 00

Steady Tone Noted in Soil Pipe

SOIL PIPE. FITTINGS.—A steady tone to the market is reported. Adverse manufacturing conditions as applied to labor are not yet overcome, and the question of securing materials, though better, is not easy as yet. Readjustment of the market in line with changes in basic materials may be expected to come about slowly.

SOIL PIPE AND FITTINGS

Medium and extra heavy soil pipe, 2 in. to 6 in.	15%
Medium and extra heavy fittings, 2 in. to 6 in.	25%
8in. soil pipe and fittings	Net list

C. I. PIPE FITTINGS.

Cast iron fittings	Net List
Plugs	15%
Bushings	15%
Flange unions, standard	Net List
Dart unions, ¼-inch to 2-inch	15%
Do., 2½ in. and larger	6½%
Nipples, up to 4-inch	45%
Do., 4½-inch and larger	40%
Do., running thread 4-in. and under	25%
Couplings, 4-in. and under	35%
Do., 4½ in. and larger	15%

MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittgs., Class A, lb.	.60	.75
Do., Class B., lb. net	.27	.37
Do., Class C., lb. net	.19	.27

New Developments in Valves Lacking

VALVES.—There have been no new or startling developments to conclude the year 1918 or greet the new year. Business is seasonably quiet, but prospects seem very bright. Prices are unchanged.

	Discount off list
Ground work	40
Compression work, standard	45
High grade	41
Cushion work	40
Fuller work, standard	43
High grade	36
Basin cocks, No. 0 standard	38
Nos. 1 and 2	38
Bath cocks	48
Flatway stop and waste cock, standard....	45
High grade	45
Roundway stop and waste cocks, standard	45
High grade	45
Brass steam cocks, standard add 10%.	
Globe, angle and check valves, standard.	Net
Do., removable seat .....Add 5%	
Radiator valves, standard	10
Do., removable seat ....Net List	
Patent quick opening valves	30
Basin Cocks—	
No. 0 and 1, Fuller pattern	43
Globe, angle and check valves, standard, medium pressure	10
Radiator valves, standard med. pressure.	30
Radiator valves, removable seat, medium pressure	35

Waste May Be Easier; Oakum

WASTE, OAKUM.—Higher prices on a couple of grades of cotton waste were recorded recently, X going up ½c to 17½c per pound and XX up 1c to 19c per pound. The outlook seems to be that a gradual easing away in prices will take place after the turn of the new year. Contracts are being made "subject to decline" and the trade is looking for somewhat lower levels. The restrictions on wool waste have been lifted. Business on oakum is somewhat quiet just now and prices remain unchanged at levels shown below:

	Per 100 lbs.
Best American	$21 00-$22 00
Clipper, spun	.....- 21 00
Do., unspun	.....- 10 50
Plumbers', spun	10 00- 10 50

Wrought Pipe in Better Supply; May Ease

WROUGHT IRON PIPE.—Better deliveries of raw materials seem to be under way, and whereas these are not marked, a general improvement is looked for with the coming of the new year. Deliveries registered in steel in the United States amounting to $3 to $4 a ton will very likely be reflected here in the price of pipe in time. Business at the present time is very good and prospects for 1919 are considered bright. Conditions under which manufacturers are operating have not eased away appreciably as yet, labor still being scarce.

Tubes Grow Plentiful; Easier

BOILER TUBES.—Indications are that the mills are cleaning up all back orders of Canadian dealers for tubes rapidly, and this means that high priced tubes are being received locally. There has been no price change made as yet on tubes, but it seems possible that the first of the year will bring with it a reduction of 5 to 10 per cent. in present scale of quotations.

BOILER TUBES—	Cold Drawn	Lapweld
1 inch	$36 00	$.....
1¼ inch	40 00	.....
1½ inch	43 00	36 00
1¾ inch	43 00	36 00
2 inch	50 00	36 00
2¼ inch	53 00	38 50
2½ inch	55 00	42 00
3 inch	64 00	50 00
3¼ inch	.....	58 00
3½ inch	77 00	60 00
4 inch	90 00	75 00

Prices shown are under revision downward.

Steady Tone in Sheets, Plates

SHEETS, PLATES.—There seems to be a steadier tone to the market on sheets and plates after a period when lower levels have been almost a weekly feature. The feeling seems to be that a pretty substantial basis has been arrived at and no sharp breaks from present levels are thought likely—as a matter of fact it looks as though present range of quotations will carry through pretty well into the first of the year until such time as supplies become quite free.

BLACK SHEETS—	Per 100 lbs.
10 gauge	$....-$7 50-$8 50
12 gauge	6 85- 7 35- 8 35
12 gauge	6 90- 7 20- 7 90
16 gauge	7 00- 7 25- 8 00
18-20 gauge	....- 7 30- 7 80
22-24 gauge	....- 7 35- 7 85
26 gauge	....- 7 40- 7 90
28 gauge	....- 7 50- 8 00
3-16 inch plate	....- ....- 7 40
¼ inch boiler plate	....- ....- 7 00

Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

GALVANIZED SHEETS—		
10¾ oz.	$9 30	$9 75
U.S. 28	9 00	9 25
U.S. 26	8 70	8 95
22 and 24	8 55	8 80
18 and 20	8 40	8 65
16	8 25	8 40
14	8 15	8 30

Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

WROUGHT IRON.
Price List No. 37—September 11, 1918
Standard Buttweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
⅛ in.	$ 6 00	$ 8 00	$.....	$.....
¼ in.	5 22	7 35	5 52	7 65
⅜ in.	5 22	7 35	5 52	7 65
½ in.	6 63	8 20	7 06	8 71
¾ in.	8 40	10 52	8 97	11 09
1 in.	12 41	15 56	13 26	16 41
1¼ in.	16 79	21 05	17 94	22 20
1½ in.	20 08	25 16	21 45	26 54
2 in.	27 01	33 86	28 86	35 71
2½ in.	43 29	54 11	.....	.....
3 in.	56 51	70 76	.....	.....
3½ in.	71 76	88 78	.....	.....
4 in.	85 02	105 19	.....	.....

Standard Lapweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
2 in.	$ 31 82	$38 30	$33 70	$40 20
2 ½in.	47 97	58 21	50 90	61 10
3 in.	62 73	76 12	66 66	79 90
3½ in.	78 20	96 14	82 80	100 00
4 in.	92 65	114 00	98 10	119 00
4½ in.	112 00	137 00	125 00	149 00
5 in.	130 00	159 00	145 00	174 00
6 in.	169 00	206 00	188 00	226 00
7 in.	219 00	268 00	243 00	292 00
8L in.	230 00	281 00	255 00	306 00
8 in.	265 00	324 00	294 00	353 00
9 in.	317 00	388 00	.....	.....
10 L in.	294 00	360 00	326 00	392 00
10 in.	379 00	464 00	420 00	505 00

Terms 2% 30 days, approved credit.
Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Lead Products Hold; Solder Steady

ZINC AND LEAD PRODUCTS.—No new prices have been named on manufactured lead products, quotations shown below being held at unchanged levels. The market on pig lead is easier and even lower levels are anticipated which may work out in declines on the manufactured goods. Solder has held unchanged at declines recently reported. The market is none too firm, lower lead and a situation that is anything but steady in tin providing an easier tendency. Prices are shown below:

Lead pipe, lb.	....	$0 14
Lead waste pipe, lb.	....	0 15
Lead traps and bends	....	Net list
Lead wool, lb.	....	0 14
Lead sheets, 4 to 6 lbs. sq. ft., in rolls, lb.	....	0 12½
Cut sheets ½ to ¾c lb. extra and cut sheets to size, 1c lb. extra.		
Solder, guaranteed, lb.	0 44	0 45
Solder, strictly, lb.	0 41	0 43
Solder, commercial, lb.	0 36½	0 39
Solder, wiping, lb.	0 34	0 45
Solder, wire, lb.	0 49½	0 54
Zinc sheets, per lb.	....	0 26

Market in Old Materials is Dull

OLD MATERIALS.—The market in old materials is dull and there is no buying or selling interest displayed by the trade. Supplies are ample, but there seems to be no encouragement to trading whatever. Quotations shown are on a nominal basis only.

Dealers' Buying Prices		
Tea lead	$0 05¼	$....
Heavy lead pipe	....	0 08
Yellow brass	0 12	0 13
Red brass	....	0 21
Light brass	....	0 09½
Heavy zinc	0 05½	0 06
Heavy copper	0 22	0 23
Stove plate, per ton	....	25 00

Ingot Metals Uncertain; Tin, Lead, Spelter Down

INGOT METALS.—It seems hard to get a definite statement of the market. As a matter of fact some interests state there is no such thing to-day. Lead declined still further in the States last week and tin went up in London. Neither move has directly influenced prices here although lead is lower than in last issue and tin has also reached lower levels.

COPPER.—There is some indication that prices will swing to lower levels. It has already come down somewhat, and this means that it treads on the toes of labor mining it, so whether much lower levels will be possible is a question. Locally there is not any change from the 30-32c per pound level.

TIN.—Higher prices in London exerted no marked influence on the market here. As a matter of fact, lower levels have again been reached in some quarters, prices as low as 75c per pound being quoted and ranging up to 85c. There is practically no movement and supplies are considered ample for limited demand.

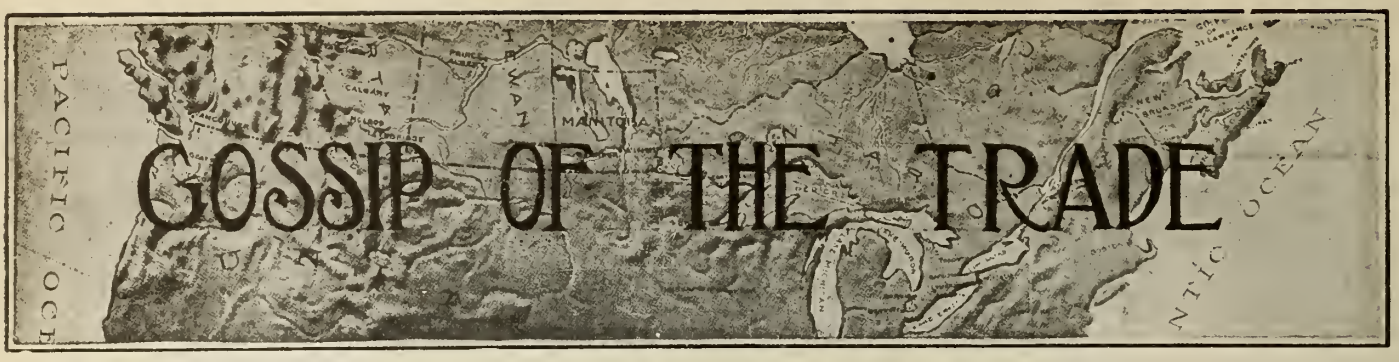
SPELTER.—The local market seems to be quite bare of supplies, but even with this condition some lower figures have been reached as will be shown by the quotations of 9½ to 10c per pound available.

LEAD.—The market has sagged still further in favor of the buyer. This is not a result of the lower levels reached in the United States, but that lower levels will be reached locally seems quite possible. Quotations range to-day from 8¼ to 9½c per pound. Business is limited.

ALUMINUM.—There have been no new or interesting developments here. Nominal quotations range around 50c per pound, but the trade, commercially, has adopted a waiting attitude as far as its future requirements are concerned.

ANTIMONY.—This metal is dull and uninteresting. The marked declines have stopped for a few days at least and any further recessions in value seem likely to come gradually rather than otherwise. Prices to-day are around 10c per pound.

PIG IRON.—A decline of $3 per ton at United States furnaces is reported, but there is still no indication that supplies are plentiful. As a matter of fact it would appear as though pig iron will be scarce for some time to come as demands from all commercial sources will be extremely heavy. There is little new to report in the situation locally, though a gradual improvement in deliveries from the furnaces is expected.



VISITOR IN MONTREAL

E. T. Needham, the worthy representative of the Canadian Wolverine Co., has been calling upon the trade in Montreal. He reports that members in that city are all in a very optimistic spirit, that conditions generally appear to be in a very healthy state, and also that the members of the Montreal Master Plumbers' Association are looking forward to the biggest and most successful convention that has ever been held in the history of the Canadian Society of Domestic Sanitary and Heating Engineers.

EATON PLUMBING DEPARTMENT, WINNIPEG

J. H. Hammond, late of Hammond and Rodway, Winnipeg, has now charge of the plumbing and heating department of the T. Eaton Co., Ltd., Winnipeg, Man.

BACK ON THE JOB

We are pleased to be informed that J. H. McCauley, the superintendent of W. J. McGuire Co., Ltd., Montreal, is back on the job. He has been under the weather for some time and to hear of him again taking the helm is encouraging.

PASSED ON

The many friends in the trade of Eric Selkirk will regret to learn that he passed on to the Great Beyond recently. Mr. Selkirk was one of the firm of Selkirk Brothers, plumbers and steamfitters, Waverley street, Montreal. His death was due to pneumonia. SANITARY ENGINEER joins those members of the craft who were personally acquainted with him in conveying its heartfelt sympathy to those whom he has left to mourn his passing on.

METHODS TO EXTINGUISH FIRES IN BIG COAL PILES

It has long been known that as the result of spontaneous combustion, fires often originate in the interior of coal piles, especially when the coal is fine and contains a large percentage of sulphur. Some recent coal-pile fires have demonstrated, however, that under favorable conditions spontaneous combustion is liable to take place even in piles composed of coal in large lumps. It depends principally upon the nature of the coal and upon the amount of rain to which the pile is exposed.

John A. Thomas, who has made a special study of spontaneous combustion, is the originator of a simple and effective method of extinguishing such coal fires. He uses a strong solution of bicarbonate of soda, which he throws upon the burning coal-pile by means of a force pump. The carbon dioxide, released from the soda, puts out the fire. The gas is assisted by the water which, by the heat of the burning coal, is transformed into steam.

INTERESTING VALVE DATA

As a part of the experimental work conducted in the hydraulic laboratory of the University of Illinois, a number of problems have been investigated. The results of four such problems have been published by the engineering experiment station of the University of Illinois as Bulletin 105.

Part I of the bulletin, "Loss of Hydraulic Head in Small Valves," by Professor Arthur N. Talbot and Fred B. Seely, presents the results of experiments on the flow of water through 1-in. and 2-in. gate valves, 1-in. and 2-in. globe valves, and 1-in. and 2-in. angle valves. In a variety of cases where such valves are used on comparatively short pipe lines as in hydraulic elevator service, in office buildings and in special apparatus, it is important to know the lost head caused by small valves when set at various positions. As very few experimental results have been published on this subject, particularly for globe and angle valves, the data given may be expected to prove useful.

Part II, by Professor Fred B. Seely, presents the results of experiments on submerged sharp-edged orifices of various shapes and sizes discharging under moderately low and under very low heads. Considerable experimenting has heretofore been done on orifices discharged into air, but comparatively few investigations of submerged orifices have been made.

Part III, "Fire Streams from Small Hose and Nozzles," by Professor Virgil R. Fleming, presents the results of experiments on 1½-in. hose and nozzles, both rubber-lined and unlined linen hose being used. These tests were undertaken to acquire data which would aid in computing the quantity of water delivered by a nozzle of the size ordinarily used in the fire protection of the interior of buildings or in computing the pressure necessary in the mains to give an effective fire stream from such nozzles.

Part IV, by Professor Melvin L. Enger, describes the orifice bucket as a means of measuring water and presents experimental data to indicate that the device is reliable for use in engineering practice.

Copies of Bulletin 105, "Hydraulic Experiments with Valves, Orifices, Hose, Nozzles, and Orifice Buckets," may be obtained without charge by addressing the Engineering Experimental Station, University of Illinois, Urbana, Illinois.

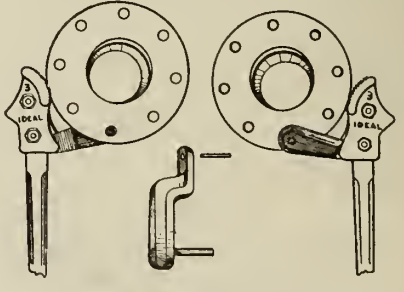
NEW PIPE WRENCH ATTACHMENT

Very few fitters are there that have not experienced trouble in tightening a pipe flange on at close quarters. Therefore it will be good news to most to know that a device has been put on the market to relieve such troubles. See accompanying illustrations:

The Ideal flange attachment is quickly attached to the wrench, in place of the chain, when the tool is to be used as a flange wrench. The special steel flange link is securely held in place by a loose steel pin.

With this device the Ideal wrench insures a grip at two points of contact. In other words, gripping each edge of the flange, there is no chance of slipping, and furthermore, a tremendous leverage can be brought to bear.

The Ideal wrench with flange attachment is also reversible and can be used



on either side of the flange. The use of this attachment permits an exceptionally large range of work, in fact, the capacity of the flange link is even larger than the pipe capacity of the tool.

The Ideal wrench with flange attach-

Continued on page 32.

Master Plumbers Elect Officers

Splendid Meeting Held and Reports Received—A Year of Progress Ahead—Big Increase in Building Activity Likely — Agitation Continued For Representation on Council of Arts and Manufactures

TELESPHORE Latourelle was unanimously elected as president of the Montreal and District Master Plumbers' Association for the year 1919 at the annual meeting held in the Builders' Exchange. President James Griffin occupied the chair and the meeting was characterized by a splendid spirit. The members looked forward to a banner year's activity.

The following list of names was submitted to the meeting as office bearers for the ensuing year by J. E. Walsh, convener of the nominating committee, and this was supported by Secretary John Watson: Past president, James Griffin; president, Telesphore Latourelle; 1st vice-president, W. R. J. Hughes; 2nd vice-president, H. Lavigueur; hon. secretary, John A. Gordon, and secretary, David K. Trotter. The following names also were submitted as chairmen

JNO. WATSON, Montreal

of the various standing committees. Legislation, Arthur Noel; sanitary, James Saunderson; apprentice, O. Daoust; arbitration, D. A. Bethune; price list, George Delaney; audit, Messrs. Belisle, Selkirk and Lepine. Trustees, Messrs Colford, Lalonde and McIntyre. The entire slate was given the unanimous support of the meeting and all were duly declared elected.

By virtue of his occupancy of the presidency, Past President James Griffin will be the Association's accredited representative to the Board of the Montreal Builders' Exchange for 1919.

An Important Discussion

Chairman Alex. Charette brought down a very interesting and important report of an interview which he had arranged with J. L. Decarie, secretary of the Provincial Legislature. This related to the matter of representation which the master plumbers desired, and which they had been striving to obtain upon the Board of Directors of the Council of Arts and Manufactures for the Province of Quebec. It is a big question and far-reaching in that the trade feels that it should know what class of men enter the plumbing trade. Unless it be more closely associated with the above Council of Arts and Manufactures there is little opportunity to discern the standards required by apprentices when they seek employment or when they enter business on their own account.

TELESPHORE LATOURELLE

President-elect of the Montreal and District Master Plumbers' Association. Mr. Latourelle is president of T. Latourelle and Fils, Ltee., Montreal.

JAMES GRIFFIN

Past president of the Montreal and District Master Plumbers' Association. Mr. Griffin has also been selected as the Association's nominee to the Board of the Montreal Builders' Exchange for the year 1919.

While Secretary Decarie had received the committee courteously, Chairman Charette reported that, at the present time, representation could not be granted. This was consequent upon the difficulties which would arise through the necessity of permitting other trades the same representation, for there would be many applications that could not be entertained, not from employers of labor only but as well as from other bodies. Another matter pointed out was that the schools under the direction of the Council of Arts and Manufactures were free, and it was quite impossible therefore to limit the qualifications of those seeking entrance. In view of these facts Mr. Decarie asked that the Masters Plumbers' Association submit a memorandum upon the question to him, suggesting any changes which were deemed to be in the interest of the organization, and which might result in a plan being worked out which would be conformable with the ideas of the Master Plumbers' Association.

H. W. R. HUGHES, Montreal

The wishes of the members of the craft here are that the standards be fair and reasonable, and that those wishing to enter the field as sanitary engineers

shall conform with such standards as are usually recognized in other cities and committees. It is quite unreasonable that the associations would stand idly by and permit every Tom, Dick and Harry to open a shop when and where he liked unless he was qualified by instruction and practical experience to do so.

A Promising Outlook

It is safe to state that the outlook is promising for a progressive season in this district. The craft has been taking advantage of the business that could be secured and with a confident outlook all around for new work to be undertaken within coming months there will be a readiness to buckle into new contracts with a will. To be prepared for this requires early attention to many details, and the convention promised for the early part of the closing summer ought to mean the dawn of a new energy in this part for the plumbing and heating trade. Doubtless the questions to be considered at that time will reveal new and greater opportunities. It is only by anticipating these and by undertaking

L. LEGREW, Toronto

the problems that will arise with a desire to solve them quickly and successfully that the greatest return will be possible.

MEETING OF EXECUTIVE OF CANADIAN D. S. & H. E.

Installation of Officers—Next Convention to be Held in Montreal June 3 and 4

Montreal, December 31st, 1918.

To the Officers and Members of the Canadian Society of Domestic Sanitary and Heating Engineers:

The executive officers of the society submit the following to the Craft throughout Canada, and request each and all to interest themselves in their association, and to send notice of their support to the undersigned.

A meeting of the sub-executive committee was held on the 29th of November, 1918, with the following present: President, Alex. Charette; Secretary-Treasurer, John Watson; Provincial Vice-President for Ontario, Garrett F. Frankland, and Past President James Walsh.

The following offices were declared vacant: Provincial vice-president for Quebec, chairman of heating and ventilation committee, and chairman of apprenticeship committee.

On recommendation of the Montreal association, and the following gentlemen

T. B. SMYTH

being present, they were installed in the above offices: J. Lavigueur as vice-president for Quebec; W. R. J. Hughes, chairman of heating and ventilation committee; P. C. Ogilvie, chairman of apprenticeship committee.

A motion was moved, seconded, and carried unanimously, that we hold our next convention in the City of Montreal, on Tuesday and Wednesday the 3rd and 4th of June, 1919, and that we proceed at once to organize for same.

This convention is being called purely for business in connection with the Canadian society. There is to be no entertainment until the convention is declared closed.

Your sub-executive committee requests that all officers and chairmen of committees settle down to work at once in connection with the coming convention. There has been no convention for two years, the last convention being held in the city of London, Ontario. We are sure the officers elected at the London convention are anxious to submit their reports and other business, or complaints in connection with our profession.

We wish to remind the provincial and local societies and their members that if a change is desired in the by-laws a notice is to be introduced at the convention, and that such a motion must be in the hands of the secretary at least three months before the convention assembles.

We also request that the chairmen of the several committees appoint their additional four members and forward the names to the secretary at once.

We further request that a list of the members of each local or provincial society be forwarded. You will please find enclosed copy of alteration to constitution and by-laws as made at the London convention. Kindly give this your earnest consideration, and if any alteration is required have your motion in our hands as per constitution. By-laws are being printed and will be ready to mail early in January. Forward your name and address at once.

Wishing the craft throughout the Dominion of Canada the compliments of the season,

I remain,
Yours truly,
JOHN WATSON.
Sec.-Treas. C. S. of D. S. and H.E.,
4145 St. Catherine St. W.,
Montreal, P.Q.

Under ByLaw No. 2—Secretary's Duties

In the case of the Annual Meeting he shall, not less than two months before, send to each local society a copy of all resolutions and amendments which are to be considered at that meeting.

By-Law 17a

It shall be the duty of each local or provincial society to forward to the secretary of the Canadian society an annual report which shall state, inter alia, the number of members in good standing, with the name and address of each firm. This report must be in

REPORT OF WINNIPEG PLUMBING DIVISION FOR NOV., 1918

Permits Issued

93

Inspections

Water Tests	Smoke Tests	Subsequent Inspections	Miscellaneous Inspections	Defects Rectified
32	80	300	6	139

Sewer Division

Permits issued	Connections constructed	Inspections
6	2	41

Sewer Maintenance Division

Tank Flushings Gallons	Hose Flushings Gallons	Total Gallons of Water Used
1,054,464	753,125	1,807,589

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The many advantageous features of **MUELLER** compression bibbs give maximum service from the bibb as a whole. The anti-spreading device that breaks up the whirling motion of the water and the corrugated stem and handle, allowing the handle to be set at any angle without becoming loose or wobbly, are only two of these features.

MUELLER Bibbs are the best the market affords. Write for prices.

H. Mueller Mfg. Co., Limited

SARNIA CANADA

MUELLER

the hands of the secretary of the Canadian society at least sixty days before the Annual Meeting. Each local or provincial society shall forward to the Canadian society the amount of their per capita tax within thirty days of the Annual Meeting. In the event of this amount not being received within fifteen days before the Annual Meeting the Canadian society will make draft for such amount, and the amount will be drawn in accordance with the last returns made by said local or provincial society.

By-Law No. 18

All amendments to the by-laws shall be proposed in writing, and shall be in the hands of the secretary-treasurer at least three months before the first day of the Annual Meeting, and a two-thirds majority shall be required for their adoption, and no amendment to the by-laws shall be considered by the Annual Meeting unless a copy of it has been in the hands of the secretary-treasurer of each local society at least two months before the first day of the meeting at which it is to be considered. Nothing in this article shall prevent a change in the by-laws, provided the same is carried by a two-thirds vote of the members at a regular session.

NEW PIPE WRENCH ATTACHMENT

Continued from page 28.

ment is furnished in the following sizes:

No. 2, capacity ½ in. to 3½ in. pipe.
No. 3, capacity 1 in. to 5 in. pipe.
No. 4, capacity 2 in. to 8 in. pipe.
No. 5, capacity 2½ in. to 12 in. pipe.
No. 5-A, capacity 2½ in. to 16 in. pipe.
No. 5-B, capacity 2½ in. to 20 in. pipe.

With the flange attachment, the Ideal wrench becomes the most complete pipe fitting tool on the market, as it is the only available wrench capable of doing pipe, fitting, and flange work.

The users of Ideal wrenches can purchase the flange link separately.

A CHAT ABOUT CLEANOUTS

Continued from page 15.

and there was considerable labor entailed in cutting out the plug from the iron body with a hammer and chisel, owing to the corrosive action of the sewage gases, which can be plainly seen on the lower threads.

Fig. 2 and Fig. 3 are somewhat similar cases. Figs. 4 and 5 are both brass rings that were each mounted in a cast iron disc with a gasket between it and the faced end on the iron body. In both cases the disc was battered to pieces before it would leave the body or tailpiece and both of the rings were more or less stripped of their threads by erosion, though Fig. 5 had sufficient thread left to turn out with a deal of persuasion, while Fig. 4 was pretty well cut away in the process.

TORONTO SOCIETY HOLDS ELECTION

New Men Elected — Business and Pleasure Combined — Pathescope Co. of Canada Entertains the Members at Close of Business Meeting

THE regular December meeting of the above society was held on Wednesday, December 18th, 1918, and was styled Election Night, the following officers being elected to office for 1919:

President—Thomas H. Ferguson.
Vice-President—Kenneth B. Allison.
Treasurer—Thomas M. Maxwell.
Secretary—Garrett F. Frankland.
Warden—Roy E. Belyea.
Tyler—John W. Cracknell.
Auditors—W. R. Harry Daniels and Roy C. Belyea.

Trustees

George Clapperton, Frank R. Maxwell, George McGuire, Thomas B. Smyth, Harry G. Waterman and John Wright.

Executive

George Clapperton, Harry A. Farthing, Fred H. Gentle, E. Lewis LeGrow; Frank R. Maxwell, Alex. S. Purdy, Harry G. Waterman, Fred A. Wiles, and John Wright.

The chairmen of the different committees are yet to be appointed, as well as the members of same, and will be announced later upon appointment by the executive committee.

Mr. John Wright, chairman of the Sanitary and Legislative Committees for 1918, presented his report for the year, and same was referred to the Executive Committee for action thereon.

Secretary Frankland's report on the Canadian Building Industries Conference, held in Ottawa, was ordered to be forwarded to the members in abstract form.

The evening closed with a delightful programme of moving pictures, for which pleasure the members were very thankful to Mr. William Redpath, manager of Pathescope of Canada, Limited.

HOW ONE FIRM INSTRUCTS ITS FOREMEN TO ACT TOWARD VETERANS

One of the largest concerns in Canada has issued the following notice to its foremen in reference to proper treatment of returned soldiers as employees If all employers realized the truth of its statements there would be fewer re marks about the alleged unreliability of returned soldiers as workmen. This uncertainty is only a phase of short duration and the man who has had sufficient conscience to offer his life for the principles for which British Empire is at war, is pretty sure to have enough conscience to do his work faithfully. Here is the notice:

"How do you treat a returned soldier working under you? Do you consider him as an ordinary workman, let him shift for himself and look on his mistakes only as you would an ordinary employee? If so, you are assuming that he is in all respects just a normal man and should be able to do the same work as quickly and as well as the average employee. If you do, you are wrong.

"Most returned soldiers' constitutions are broken down. They have been gassed, shell shocked, and tortured by wounds, and consequently, are highly strung and nervous, and will be for some time to come. What they make of themselves depends upon you. If one of these men make a mistake and is roughly reprimanded, he is likely to shake like a leaf, get excited, etc., and be very difficult to make anything of; this is wrong. The greatest tact, care and attention that you can give these men in helping them to become useful employees is what the company expects, and moreover—you owe it to them.

"There are bound to be some exceptions, and some men will fail to make good. The success or failure of the majority, however, depends on you, and it is your privilege to help your country in this national crisis by endeavoring to make useful citizens out of the nerve-shattered men that are commencing to come back to us from the front."

LEAD-WOOL FOR CAULKING GAS-PIPE JOINTS

Gas engineers admit that about 6 per cent. of the gas manufactured is lost through leaky joints. The Detroit City Gas Company have carried out a series of experiments to test the merits of various materials on the market for caulking cast-iron pipe joints. The most interesting fact developed was the strength of a lead-wool joint. The difficulty in breaking the joints led to the belief that cast-iron pipes could be caulked alongside the trench and lowered in without disturbing the joint. This was tried on 16-in. pipes, and three lengths at a time were successfully handled in this way. In making a joint with lead-wool, the jute is first driven in as tightly as possible, then the lead-wool, rope by rope. Each blow upon the lead expands it in the pipe and at the same time drives back and holds the jute so that the lead completely fills the lead space. The result is a joint that can shift several inches without leaking.—"American Gas Engineering Journal."

Simplicity is the Keynote of .. MORRISON .. Automatic Cellar Drainers

The Morrison Automatic Cellar Drainer is very **easy to install,** and when once installed needs **no further attention.** The working parts are all placed well above water, with no chance of dirt getting into them.

Customers quickly realize the **simplicity** and **advantages** of this **Ideal Cellar Drainer.** That's why there is such a popular demand for it all over Canada. That's why it's so **easy to sell** and a **money-maker** for you.

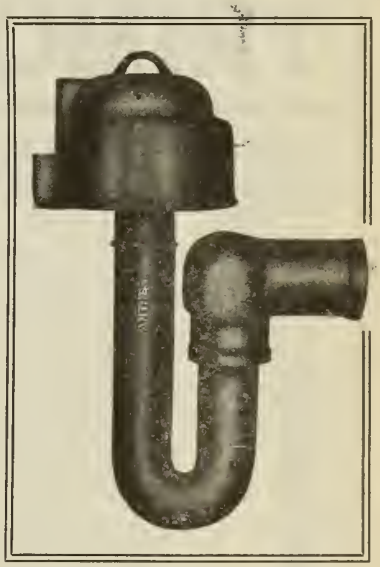
Backed by the Morrison Guarantee and Reputation, you can't go wrong.

Write us for further information and prices.

The James Morrison Brass Manufacturing Co., Limited

93-97 Adelaide Street West, TORONTO, Ontario

A Syphon Is The Heart Of a Sanitary Septic Tank— *Anthes Syphons Are Faultless!*



Regular and intermittent discharge in connection with the sewage system is absolutely necessary or the system installed is a failure.

Anthes Syphons and Soil pipes have no superior for permanence, quality and price.

Anthes Syphons are unconditionally guaranteed. We manufacture a full line of cast iron pipe fittings at both our plants.

Ask your jobber for "Anthes" Syphons, soil pipe and fittings.

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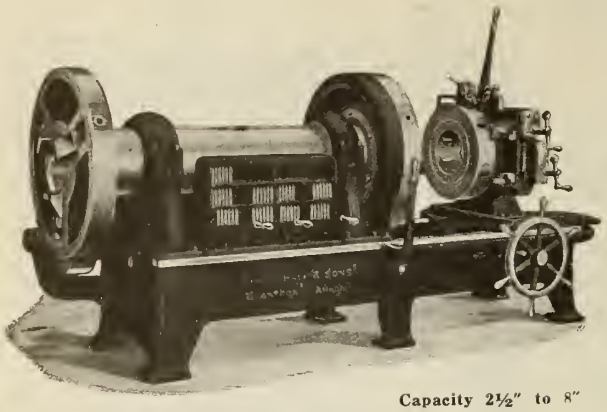
Pipe Machines of Merit



Capacity 2½" to 8"

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Duplex Improved Gear Box Driven. Capacity 2½ in. to 8 in. inclusive.

Note the drive belt at rear out of operator's way. Elevated die cabinet, control lever and speed levers all convenient to operator's right hand. Sliding die head.

These machines are equipped with a friction clutch, enabling operator to revolve pipe a few inches, if necessary.

Pipe Machines ranging from ⅛ to 18".
Nipple Machines ranging from ⅛ to 4".
Roller Pipe Cutters ranging from ⅛ to 4".
Delivery from stock.

Write us for full particulars and prices.

John H. Hall & Sons, Ltd., Brantford, Can.

The Wrench of 25% Greater Efficiency

TRIMO PIPE WRENCH

Two new features have been recently added to the Trimo Pipe Wrench, namely Nut-Guards, in all sizes, and unbreakable steel frames, in leading sizes.

The Nut-Guards prevent the accidental rotation of the nut while in use.

These improvements add 25% to the usefulness of the tool.

The Trimo Pipe Wrench is made with wood handles in 4 sizes, 6-in., 8-in., 10-in., 14-in. and in steel handles in all sizes, 6-in. to 48-in. inclusive.

All Trimo Pipe Wrench parts are interchangeable.

The inserted jaw in the handle can be readily replaced when worn, thus adding to the life of the tool.

Nut with Nut-Guards

Inquiries from Importers and Dealers Solicited. Send for Catalogue No. 55.

TRIMONT MANUFACTURING CO.

Cable Address: Triwrench
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Roxbury (Boston) Mass., U.S.A

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Amherst Foundry Co. ....Inside Front Cover
Anthes Foundry Co. 33
Beaton & Cadwell 36
Beaton & Corbin 40
Borden Canadian Co. 40
Bicalky Fan Co. 40
Canadian Brass Co. 7
Canadian Consolidated Rubber Co., Ltd. .. 1
Canadian Tube & Iron Co. 38
Canadian Wolverine Co. 2
Chamberlain Desolvo Co. 9
Canada Metal Co. 6
Consumers Metal Co. 40
Dart Union Co. .....Inside Back Cover
Dunham & Co., C. A. 35
Empire Manufacturing Co. .....Front Cover
Galt Brass Co. .....Back Cover and 11
Goodwin, F., Co. 8
Gummer & Co., G. W. G. 4
Hall & Sons, John H. 34
Hause Mfg. Co., Chas. F. 40
Hoyt Metal Co. 36
International Malleable Iron Co. 9
Jardine, A. B., & Co. 2
Jenkins Bros., Limited 8
Kerr Eng. Co., Ltd. .....Inside Back Cover
McDougall & Co., R. 36
Morrison Brass Mfg. Co., Ltd., Jas. 33
Mueller Mfg. Co., H. 31
Port Hope Sanitary Mfg. Co. 12
Simplex Manufacturing Co. 40
Standard Sanitary Mfg. Co. 5
Steel & Radiation, Limited 38
Trimont Manufacturing Co. 34
Toronto Hardware Mfg. Co. 36
Wallaceburg Brass & Iron Mfg. Co., Ltd. 3
Warden-King, Ltd. 3
Williams, J. H., & Co. 32

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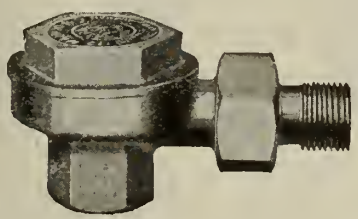
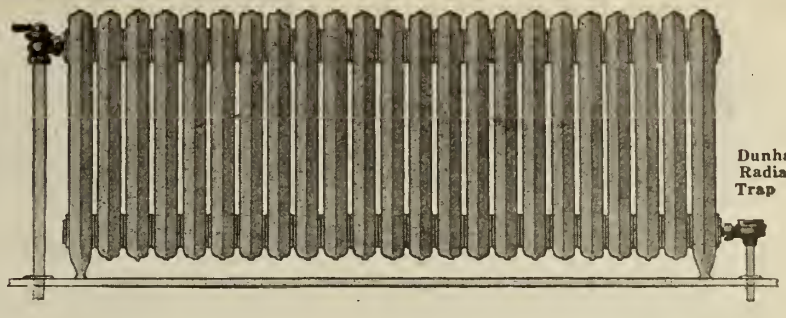
Canadian publications of wide circulation are carrying this message in an intensive manner to home owners and those in charge of offices, factories and industrial plants.

You can get your share of this new businesss by signing our Service Station contract. Write for the details of this practical plan of co-operation.



The Dunham Radiator Trap is made with special roughing-in dimensions for replacing imitating devices.

Dunham Packless Tube and Valve



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The Dunham Inlet Valve is really packless—cannot leak. The Dunham Radiator Trap comprises a body, a cover and a thermostatic disc secured in the cover. Its action is positive over a wide range of temperature. Dunham products are only of one quality—the highest.

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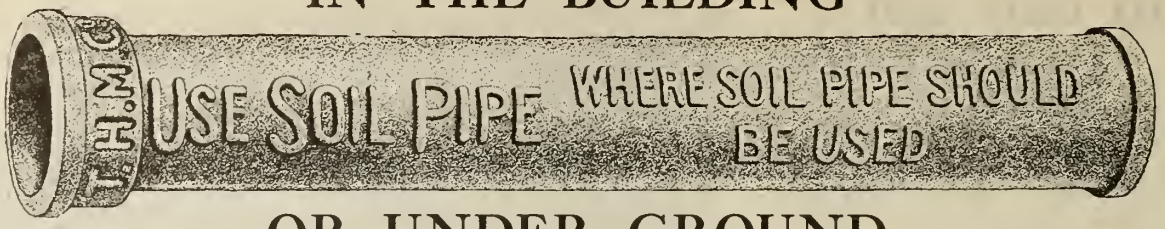

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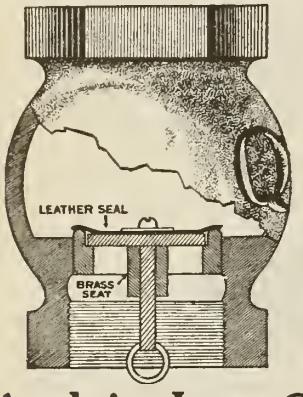

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There are more pump troubles caused by "leaky" valves than from all the wear and tear which occurs in the average life of a pump.

The "Q" valve will overcome all priming troubles, and water once raised above it, through the suction line, will not leak out.

If you want the pumps you instal to give maximum, you will require to use the only valve on the market that JUST CAN'T LEAK.

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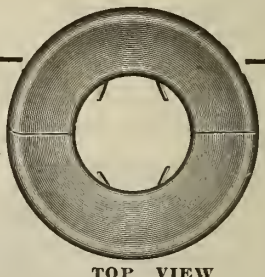

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The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

High quality at the right price.

Gem No. 4 Automatic Air Valve

Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

Write for catalog showing our complete line of specialties.

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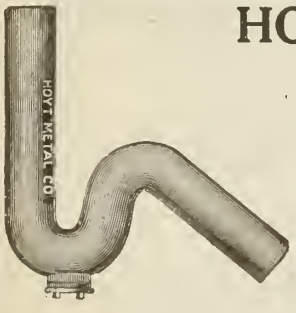

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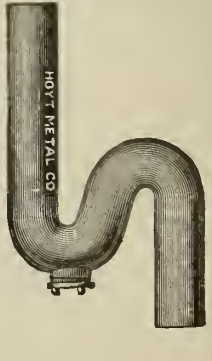

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Galt Brass Mfg. Co., Galt.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Standard Sanitary Mfg. Co., Ltd., Toronto.

Country Residence Equipments.
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H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

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Empire Mfg. Co., Ltd., London and Toronto.
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Steel & Radiation, Ltd., Toronto.

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Pittsburg Water Heater Co., Toronto.
Rudd Manufacturing Co., Toronto.

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Starting with the January issue, MACLEAN'S MAGAZINE comes out in a new size—11 x 14¼—same size as *The Saturday Evening Post.* This change will enable us to give readers more entertaining articles and stories, and a very much enlarged "Review of Reviews" Section. You will find this January issue of MACLEAN'S more pleasing and instructive than the great majority of magazines you find displayed on news-stands—and

contents are carefully censored—no sex stories—you can take it into your home with the utmost confidence.

A word about the contents—

"Why Laurier Will Wait"

In discussing the policy of the Liberal leader during the coming session of Parliament, J. K. Munro predicts, in January MACLEAN'S, that Laurier will allow Union Government a free hand. In this policy of inactivity "he sees the way open to the accomplishment of all his purposes. If he is half the politician his friends believe he is, he will sit and smile and wait—yet a little longer."

All Canada is interested in what is going to happen in Ottawa. J. K. Munro, veteran press gallery man, is a shrewd observer, and his political articles in MACLEAN'S have stirred up more comment than anything else appearing in the press of the country. He knows politics from the inside. "Why Laurier Will Wait" is a forecast of the near future that bristles with interesting points. A few of the other "head-liners" in this issue:

Bolsheviks at Work in Canada

A senstaional article on activities in subterranean circles. There are foreigners in Canada ready to wave the red flag.

Achievements of the Canadian Army

Since the Canadian Division was formed, they have not retired a foot nor lost a gun—a marvellous record. An inside story of how this great army was handled and controlled is told by H. F. Gadsby who spent a month at Headquarters during the last great offensive.

The Grave Dangers of Peace

An article by Agnes C. Laut on the insidious new propaganda being launched by the Germans to split the Allies.

Jock in a Juggernaut

The most interesting war article in a long while, because it is new—it deals with experiences in the tanks.

AND THESE AS WELL:

The Dance Halls of Dawson - By E. Ward Smith

My Hour - - - By Robert W. Service

The Strange Adventure of a Rialto Rainstorm - By Arthur Stringer

The Minx Goes to the Front - - - - By C. N. and A. M. Williamson

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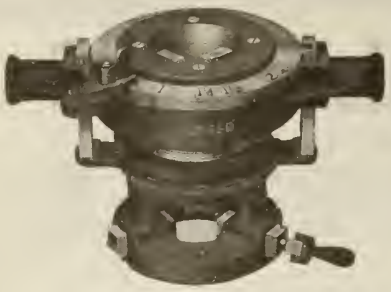

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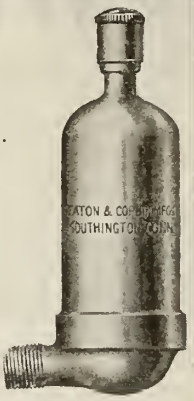

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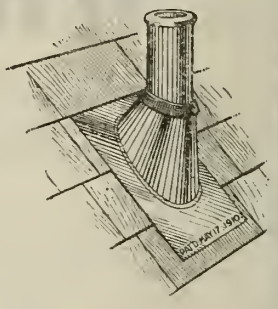

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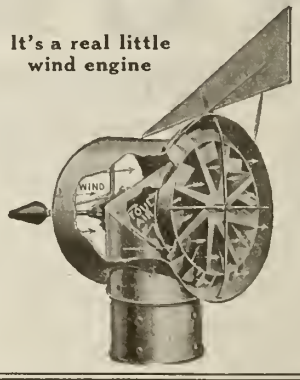

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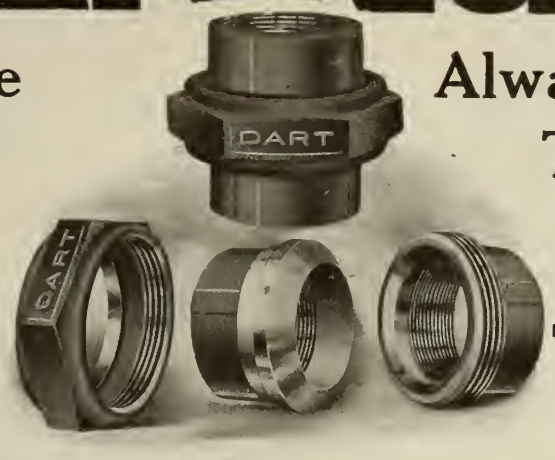

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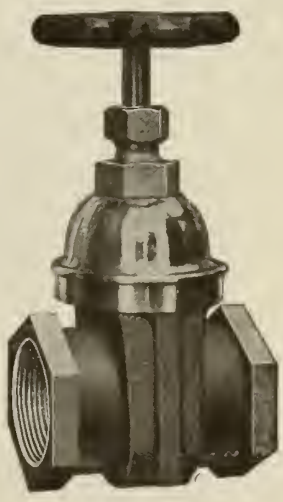

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SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

Vol. XIII. Publication Office, Toronto, January 15th, 1919 No. 2

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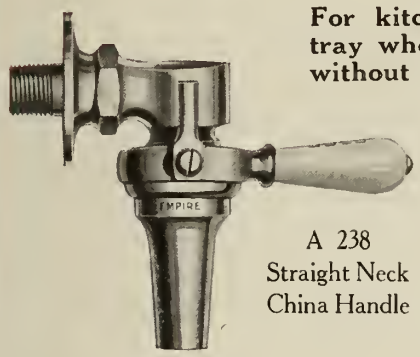
For kitchen, slop sink and laundry tray where quick and easy operation without splashing is desired.



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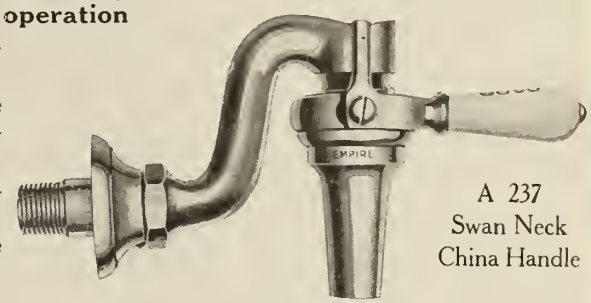

A 237
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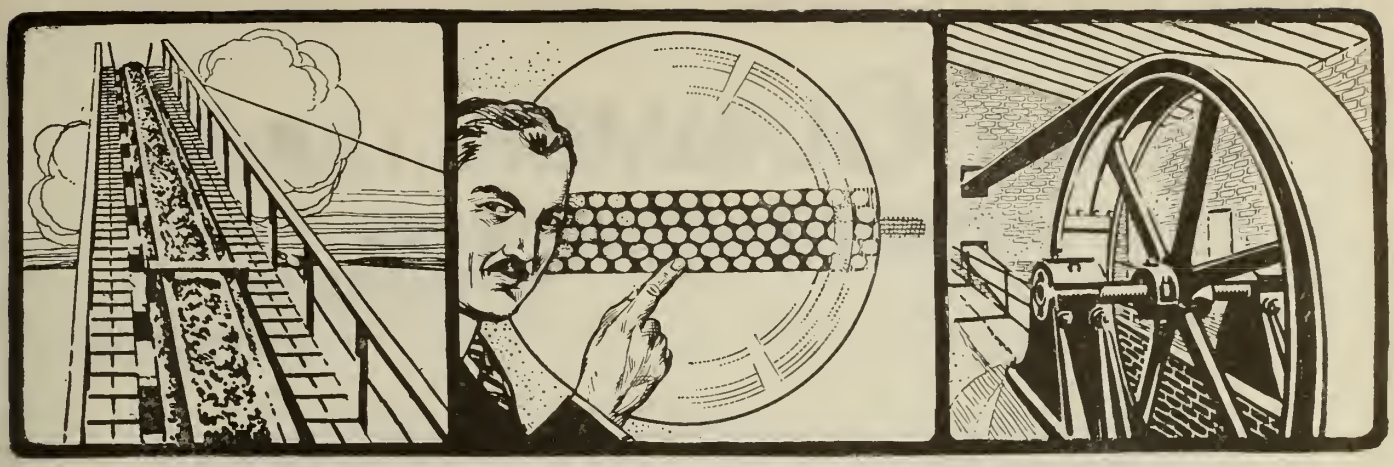

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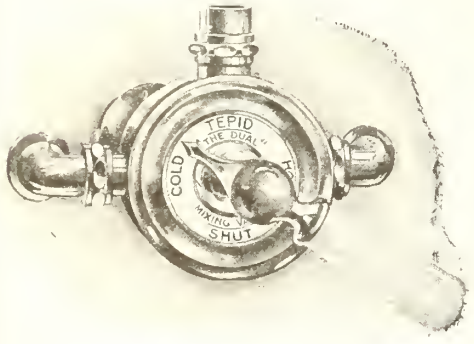

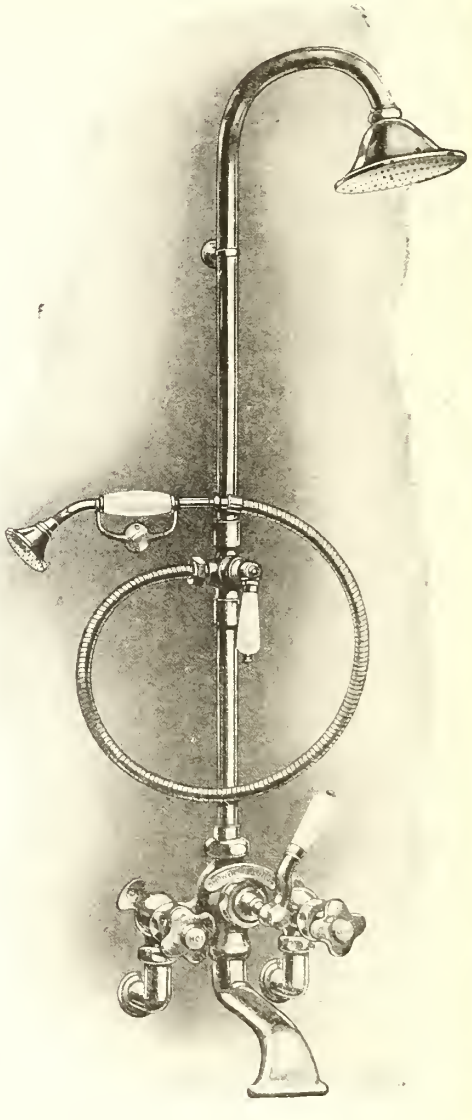

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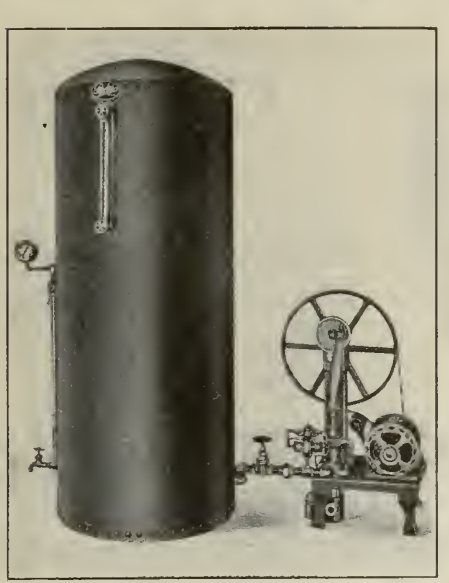
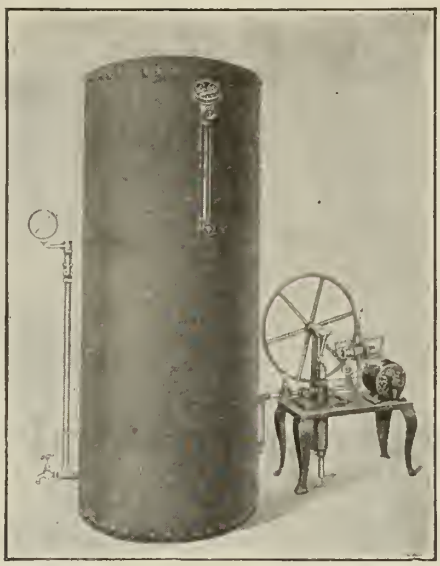
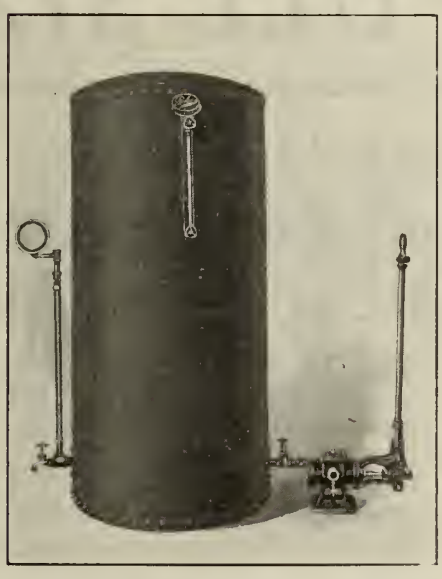


500 Series—Automatic Electric 250 gallons per hour.



300 Series—Automatic Electric 125 gallons per hour.



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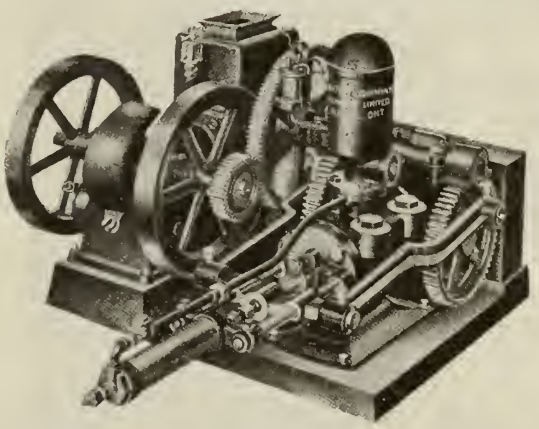

Direct connected Gasoline Engine Pumper, Automatic Control.

National Equipment Co., Limited

TORONTO, CANADA

Positively the Most Perfect Valve on the Market

Wolverine Backwater Valve

Rubber Ball Float automatically rises to seat when water is backing up.

Valve also has Brass Emergency Shut-off.

Turn the Strainer and valve has double seal.

All working parts and seat of cast brass.

Accessible for cleaning.

Heavy Bar Strainers, also Ventilation Caps and Refrigerator Drain Traps. Complete line listed in

Catalogue "C"

Send for this valuable book of information on Plumbing Specialties.

Canadian Wolverine Company, Ltd.

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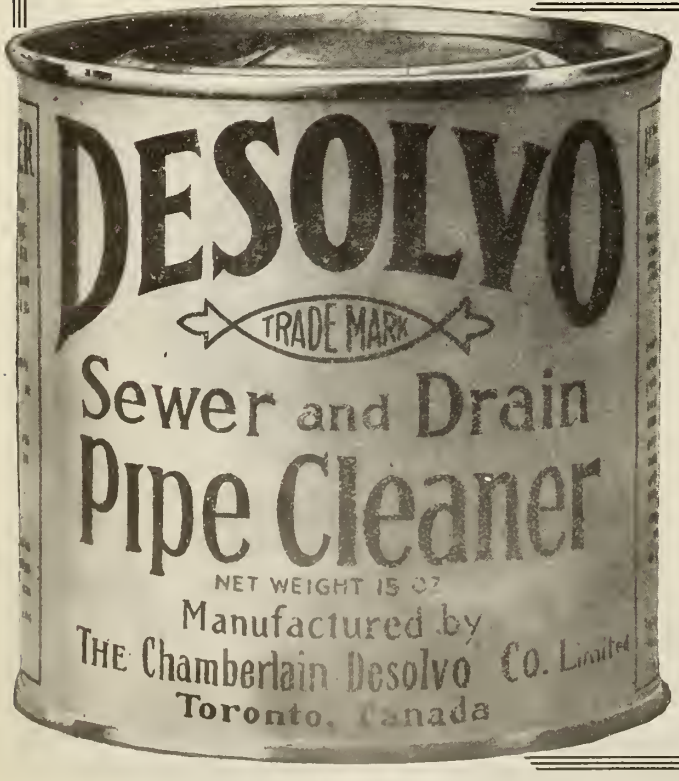
THIS IS FULL SIZE



Just Desolvo And Cold Water— *The Work's Done*

Mix Desolvo with **cold** water and you have a preparation that will remove any obstruction that is soluble from pipes and stacks.

We guarantee that the **Desolvo** way will always be **your** way from then on.

Prove it. Make out an order **now** and send it in to your jobber.

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All Brass Goods Bear this Stamp of

QUALITY

CANADIAN
BRASS
GALT. ONT.

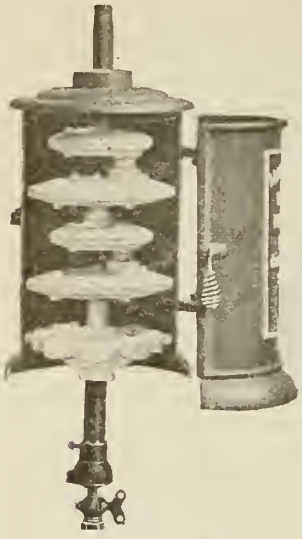
CLOSET COMBINATIONS

Carrying the TRADE MARK below are Insured Against All Defects

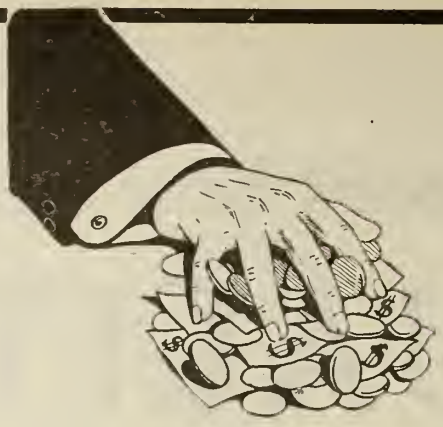
Embody these in your New Year's Resolutions

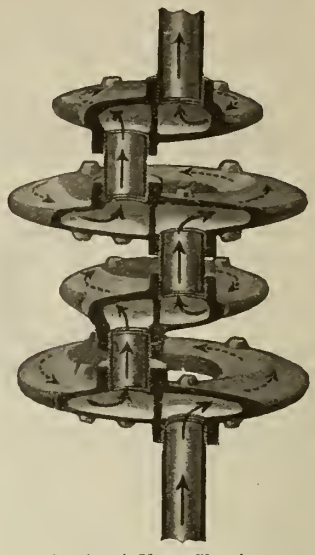
CANADIAN BRASS COMPANY, LIMITED

GALT TORONTO



The Completed Imperial Water Heater





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when we put the Imperial Gas Water Heaters on the market.
They are undoubtedly the most economical on gas of any other make. They are not only easy on gas, but with the perfect circulation they

"HEAT WATER IN A JIFFY"

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WE SPECIALIZE IN

PIPE THREADING TOOLS

Take Another Look At This Job

ESTABLISH PEACE

If you desire to establish lasting peace in your shop, you will have to furnish your men with good tools. Men will not do the same amount of work if that work is hard. The more you *INVEST* in tools if they're good tools, the less you will SPEND in labor. To invest is to establish an asset, to spend is to create a liability. Our tools will save you money and make peace in your shop.

ESTABLISH PROFIT

Work made easy becomes a pleasure. Jardine and Toledo Pipe Threading Tools make threading pipe so easy that a boy can thread a 4-inch pipe as easy as he can thread a ½-inch pipe.

Not only so but when a thread is made with one of our tools it's a good thread. No cutting off pieces of pipe. No lost time and no leaks. That's the way to establish a profit on every job.

A. B. JARDINE & COMPANY, LIMITED, HESPELER, ONT.

Sole makers of "Jardine" Pipe-Threading Tools.
Sole licensees to manufacture and sell Toledo Pipe-Threading Tools in Canada.
Agents, Winnipeg and West—Stanley Brock, Ltd., Winnipeg, Man.
Brockville and East—J. R. Devereux, 358 Beaver Hall Square, Montreal.
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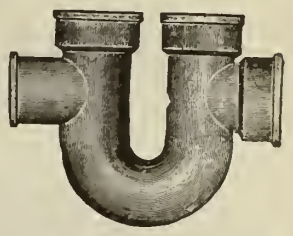
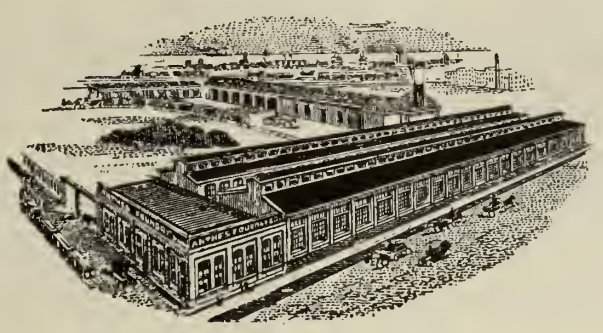
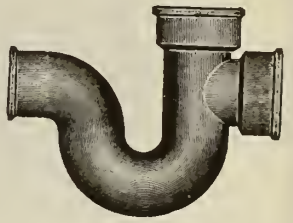
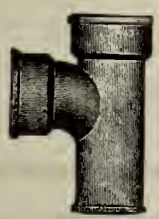
WE CAN SHIP FROM STOCK





TORONTO PLANT





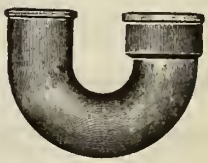
You need not carry too large a stock when you can draw from our plants. Every jobber in Canada can furnish you with Anthes products.

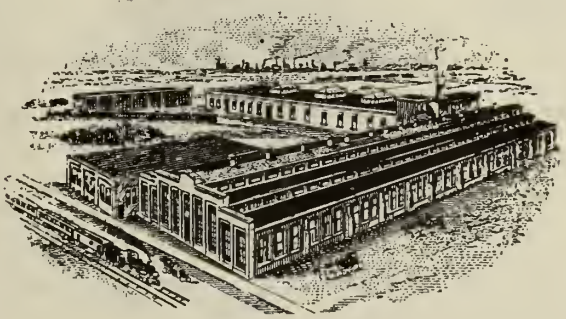
We have one large plant at Winnipeg, from which all our Western customers procure supplies, and our Toronto plant takes care of Eastern trade.

We fully guarantee our line of soil pipe and fittings, and have recently renewed all our patterns, adding to our plant such improvements as will ensure a continuous supply.

We manufacture the Anthes Septic Tank Syphon for use in connection with small sewage disposal systems for rural homes and small institutions located where no sewers are in operation.

Our engineering department is at your disposal and will design any sewage disposal system in connection with the use of our syphons.

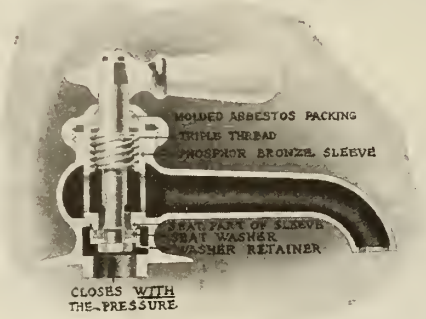




WINNIPEG PLANT

ANTHES FOUNDRY LIMITED.

Quaturn is the Faucet



Exclusive Features
(Patented)

Another reason why.

The Quaturn *body* simply lets the water flow through. All the working parts on which wear and tear come are removable and interchangeable. Bibbs, Basin Cocks, Bath Cocks, Ball Cocks, all have the same Quaturn structures and a few minutes will make any piece as good as new.

Write or telephone our nearest office for other features. A letter is waiting to go to you.

The Wallaceburg Brass & Iron Manufacturing Company, Limited

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Mr. L. N. Vanstone, 10 Wellington Street E.	Moncrieff & Endress, Ltd., Galt Bldg.	J. R. Devereux & Co., 358 Beaver Hall Sq.

First Cost *versus* Upkeep Cost!

The purchase price means nothing if the upkeep cost is not low.

The purchase price of King Boilers is no more than the average boiler and yet—

The consumption of fuel—*the upkeep cost* is lower—considerably lower.

The thin, peculiarly shaped waterways in the "King" mean quickly heated water and perfect circulation, which causes a saving in fuel because it obviates the necessity of "extra firing" to move cold water from the radiators.

The Trade should use this quick-heating, fuel-saving argument now while fuel is scarce and high in price.

WRITE US FOR PRICES.

Steel and Radiation, Limited

Head Office, FRASER AVENUE, TORONTO

304 University Street, MONTREAL 101 St. John Street, QUEBEC

AGENCIES IN ALL LEADING CITIES

PLUMBERS Trade K—T Mark BUILDERS

GALT Supplies ONT.

GREY-CASTINGS-IRON

STANDARD

Our Soil Pipes and Fittings are of PLEASING design and perfect workmanship, and our range covers all the modern fittings of Caulked and Threaded Joints.

SPECIAL

Our K-T Range Boiler Stands, Sink Brackets, Tub Stands, are good Roof Fittings, Our Threaded Tees, Y's and Specified Threadings are Tapped Straight with full Threads.

THE KATIE FOUNDRY

GALT - ONTARIO

Pipe Fittings

Made in Canada

The Brand that has the Quality

M Brand Pipe Fittings, etc., give a service and satisfaction that will invariably get you re-orders and much new business as well.

A trial of the goods will prove this claim.

CAST IRON FITTINGS

With this brand mean fittings made with iron of high tensile strength—proper proportions and correct tappings.

RECESSED DRAINAGE FITTINGS

MALLEABLE FITTINGS

With this brand mean fittings made of Air Furnace Refined Iron, reamed and tapped to gauge with perfect threads.

Standard and Extra Heavy Flanged Fittings and Flanges. Galvanizing Malleable and Gray Iron Castings of all Kinds.

International Malleable Iron Co., Limited, Guelph, Ontario, Canada

Mark of Proof Is Proof of Quality

There's proved and certified strength in every WILLIAMS' IMPROVED "VULCAN" CHAIN PIPE WRENCH

Each and every Flat Link Chain is "proof-tested" to two-thirds of its listed catalog strength in a standard testing machine. To each chain so tested is attached the Gray Leaden Seal, illustrated above, and every Flat Link Chain leaving our works *must* bear this seal—the Proof of Quality—as evidence that it has passed our standardized "proof-tests."

Look for this Mark of Proof for it's Proof of Quality—it guarantees uninterrupted, severe service as well as safety to the operator. Williams' Wrenches—"Vulcan" and "Agrippa"—are the *only* chain wrenches which offer this certified assurance.

J. H. Williams & Co. *"The Wrench People"*

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Agents for Manitoba, Saskatchewan, Alberta and British Columbia

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M. & T. COILS EXTENDED SURFACE

Our Coils are not simply cored castings, but are specially designed to heat water with less effort and using less fuel. The extended surfaces and special tappings make the M and T Coils the most efficient on the market.

McIntyre & Taylor Limited

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WINNIPEG
322 McIntyre Block

PIPE AND THE PUBLIC WELFARE

By R. C. McWANE

A Book Just Off the Press

Every sanitary engineer should be the possessor of this book. It deals with pipe-making of all kinds, cast iron, wrought iron, steel, wood and tile pipe. It is valuable because it gives the users of pipe a true idea of how pipe lasts under various conditions when in service.

Price $1.00 Postpaid

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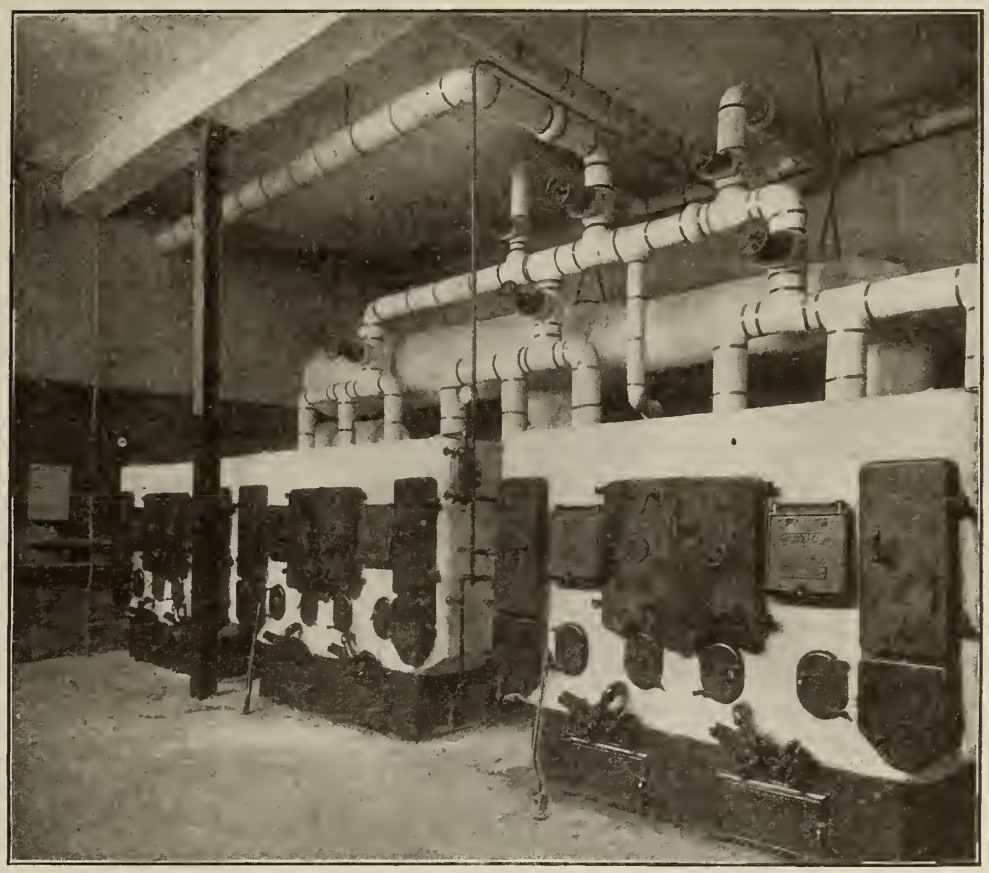
THE SPENCER IS THE MAGAZINE BOILER

Not a Boiler with a Magazine

NO HEATING SYSTEM TOO LARGE



NO HEATING SYSTEM TOO SMALL

This plant is doing duty in Earl Kitchener School, Hamilton. Installed by Adam Clark Ltd., Heating Engineers, Hamilton

3 No. 26's in battery. Combined heating capacity, 25,500 square feet.

Burns Any Kind of Fuel, Including Gas or Oil

The Spencer Boiler enables the owner to benefit from the economy in the cost of the fuel and reduction in the tonnage consumed.

The Spencer will burn any grade of fuel, including wood if desired. With regard to the burning of soft coal in the small sizes by way of the magazine, the fact that the fuel is tempered enables the boiler to burn this fuel with a greater freedom from smoke than is possible with any other type of boiler. The double water-tube construction of the Spencer Boiler also is the most efficient surface for the burning of gas or oil.

Anthracite, soft coal, and coke in the sizes known as No. 1 buckwheat, pea and small nut, will feed by way of the magazine, while the larger sizes can be fired in the boiler in the regular way—that is, in similar manner to the firing of an ordinary boiler.

Recent laboratory tests in prominent Science Departments of Universities on this continent, using low-priced anthracite coal, proved that the temperature of the flue gases leaving the boiler was less than 300 degrees, while operating at 5 lbs. steam pressure, and the ash refuse was 15.4. These results are due to the efficient heating surfaces of the Spencer Boiler, coupled with the above stated features.

We employ competent heating engineers and a service department for the purpose of providing the trade with full information for the proper installation of the boilers, and written guarantees are furnished with every specification concerning the operation and construction of the boiler in all details.

Write us for literature descriptive of the Spencer.

It will pay you to be the Spencerized heating contractor in your district.

The Spencer Heater Co. of Canada, Limited

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"Business men do not realize the value which trade journals and technical magazines may have for them in increasing the efficiency of their factories and in giving them a broad and comprehensive view of their business.

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"Our trade journals and technical papers are the best in the world, and they should be supported and encouraged by our business men.

"Copies should be placed where employees can see them and they should be urged to read and study them.

"These papers are preaching the gospel of sound business on practical lines and are helpful not only to business but to the country as a whole.

"If the suggestions made by them in the past had been followed by our business men it would not be necessary at this time to point out some of the fundamental weaknesses in American business."

—Edward N. Hurley, formerly Chairman of the Federal Trade Commission, in "The Awakening of Business."

The following is list of the MacLean publications. Every publication is a leader in its field. Write us for any information you may desire with regard to the field covered, advertising rates, etc.

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A REAL MONEY MAKER

True conservation means investing money in such a way as to give maximum service to all concerned at least possible cost.

The cost of doing without a **Clark Temperature Booster** on a hot water heating system means at least a loss of 15 per cent. at the coal pile. And it's a patriotic duty these days to conserve coal.

A REAL COAL SAVER

If you tell your customer that you can show him how to save 15 per cent. of coal and get better results from his hot water heating system and that the cost only amounts to about the price of a couple of tons of coal, he'll ask you how.

CLARK TEMPERATURE BOOSTERS

will do all and more than we claim for them. They will not only increase the temperature and save coal when installed on a good heating system, but will make a **sick job well** and keep it well.

Write your jobber about it.

GALT BRASS CO.

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GALT

ONTARIO

"MAKE NEW BUSINESS FROM OLD BUILDINGS," says the advertisement before us, and from old buildings the Plumber will get most of his business during the early months of 1919.

Under the caption of what you must do yourself, the writer says to every Master Plumber:

> **"PERSONAL WORK:** Do not expect any large volume of business from new construction. You must encourage remodelling and refitting. Talk about it with every one whom you meet. Instruct your clerks, your workmen, your helpers to do this. Put the situation squarely before them, and have them help you in your local sales promotion work. We are confident that the volume of business can be kept up to about normal if you and your force will do your personal share. Spend more of your time calling on house-owners and arousing their desire to have more of the economies and conveniences which you can furnish.
>
> Adopt the suggestions made above to your business and watch it grow!"

Our company makes the finest line of plumbers' enamelware, and issue booklets and descriptive matter that will help the plumbers to close a contract. The booklets are free on application.

Port Hope Sanitary Mfg. Company, Limited

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Head Office:
ROYAL BANK BUILDING, TORONTO

TORONTO SHOW ROOMS
119 King St. East

WINNIPEG OFFICE
405 Tribune Bldg.

MONTREAL SHOWROOMS
234 Beaver Hall Hill

HALIFAX OFFICE: 58 Bedford Row

SANITARY ENGINEER

VOL. XIII. JANUARY 15, 1919 No. 2.

INVESTIGATION OF CORROSION IN HOUSE DRAINAGE PIPING IN CHICAGO

A Paper Read at the American Society of Sanitary Engineers at Their 13th Annual Convention, October, 1918—One of the Most Interesting and Thorough Investigations Ever Made in Connection With House Soil Waste and Drainage Piping in America

By THOS. J. CLAFFY, Assistant Chief Inspector of Plumbing, Chicago, Ill.

IT has been observed for some time by those in close touch with plumbing installations in Chicago and elsewhere that under certain conditions, iron pipe is affected seriously by rust. The corrosive element, whatever it may be, seems to have more effect on one kind of pipe than on another, and also to be worse in some buildings than in others. In previous investigations conducted by the Research Committee of this society, special attention was given to the house drains and sewers.

It was suggested to the author some months ago that some attention should be given the pipe in the system above the basement or cellar floor. An investigation of this kind appeared to be not only practical, but of great value, if successful. About May 1st an inspector was, therefore, assigned to make a canvass of that portion of the down-town section of Chicago covering La Salle, Clark and Dearborn streets, between Randolph and Van Buren streets. In this section we find nearly all of the large office buildings, several banks, and the Municipal and County buildings. Also, the U.S. Government building, which contains the post office and federal courts. On account of war conditions the investigation did not include this building. We aimed to confine our attention to buildings 6 stories and upwards, and over 5 years old. One or two less than five years were included because of the conditions noted in buildings very close to that age.

The Introduction of Screw Pipe

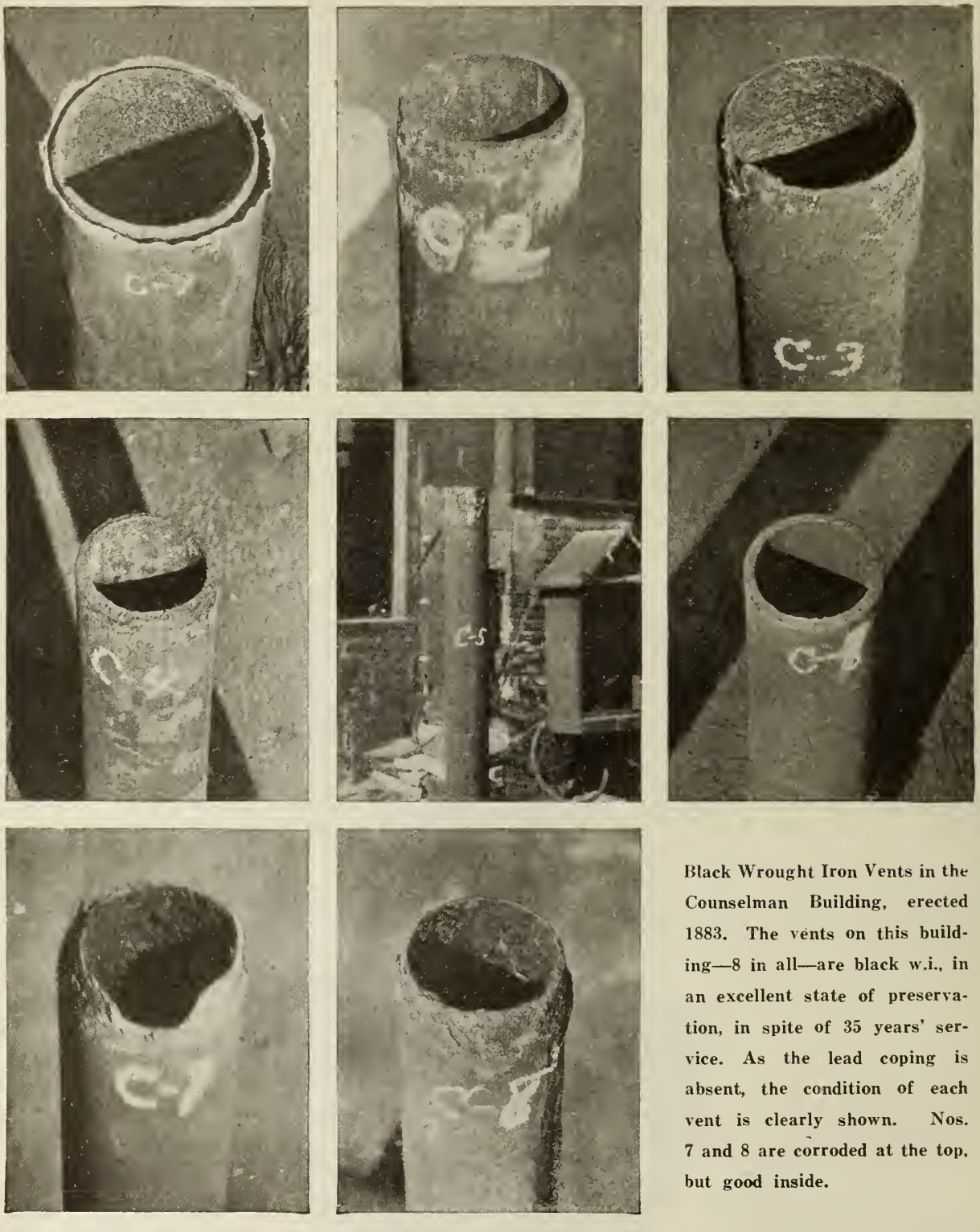
Cast iron pipe has been recognized for many years as a very durable material for soil, vent or drainage purposes, and, consequently, has been much used in building construction, and, no doubt, its use will continue. When construction of buildings over six stories high began, a new epoch was introduced in building construction and we very shortly had buildings twice that height and higher. About 30 years ago began the common use of screw pipe in plumbing systems in such buildings. With the introduction of special recessed drainage fittings such pipe soon became exclusively used, and the entire system became known as the Durham System of House Drainage, Mr. Durham being the inventor of the fittings used. Because of the fact, noted in recent years, that there is a great deal of corrosion in drainage pipe systems, it was deemed expedient to find out, if possible, the relative life and merits of cast iron, wrought iron and steel pipe in such systems.

T. J. Claffy assistant chief inspector of plumbing under whose supervision this investigation was conducted.

Method of Investigation

In making this investigation, the inspector was required to report on the height and age of each building separately; the number of vents at the roof line; size, and whether pipe was cast iron or screw joint; to obtain a sample where possible for test purposes; and, under the head of "Remarks," to describe such conditions as were found. Photographs were obtained of sufficient vents on the roofs to show an existing average of their condition. The inspector also was interviewed, whether the owner, superintendent, engineer, or other person. In order to distinguish between wrought iron and steel pipe, it was necessary to take samples for test, filings being obtained for chemical tests and pieces of the pipe for fracture tests. In obtaining filings, the outside skin, which was generally either

Plate No. 1



Black Wrought Iron Vents in the Counselman Building, erected 1883. The vents on this building—8 in all—are black w.i., in an excellent state of preservation, in spite of 35 years' service. As the lead coping is absent, the condition of each vent is clearly shown. Nos. 7 and 8 are corroded at the top, but good inside.

BLACK WROUGHT IRON, 35 YEARS OLD, COUNSELMAN BUILDING.

WROUGHT IRON AND CAST IRON IN SAME SERVICE

No. 6—35 years old.
Cast Iron Pipe, Gaff Building.

No. 8—35 years old.
Wrought Iron Pipe, Gaff Building.

No. 9—Cast iron covered by lead coping—35 years old.
Gaff Building.

Plate No. 2

WROUGHT IRON AND STEEL IN SAME SERVICE

National Life Building, erected 1902, Chicago

Nos. 14 and 16 are typical of the steel vents on this building, which are from 50% to 75% destroyed. No. 15 shows iron vent on same roof, corroded, but only to a small extent.

Plate No. 3

TABLE I - SOIL AND VENT RECORDS

All lines are black unless otherwise indicated Letter G means galvanized. Letters XH and S after cast iron mean extra heavy and Standard weight respectively

Investigation number	Name and Location of Building	Age of installation	No of Stories	Total No of Vents	Vents Tested	Pipe Material	CONDITION of VENTS			Remarks.
							Cast Iron.	Wrought Iron	Steel	
1	Cunard Building. 140 No Dearborn.	2 yrs	14	8	8	Steel G			6 good as new; 2 Started to Scale	
2.	Lumber Exchange, 3-11 So. LaSalle	3 yrs	16	16	-	Steel B & G			Good	Photo shows Appearance of new pipe
3.	Westminster Building, 110 South Dearborn.	3 yrs.	17	11	8	8 Steel G.			1-Scaling; 2 galvanizing slightly attacked-5 as good as new	
4.	City Hall Sq., 19 So. LaSalle.	6 yrs.	21	13	-	13 C.I	Pockmarked but good.			
5	Y M C A 19 So. LaSalle	6 yrs.	16	17	17	Steel G			1-Scaling 15-Pitted 1-O.K.	Four top floors steel, built 6 yrs. W.I. Soil pipe branch 25 yrs. old-Rusted through at top.
6.	Com. Nat'l Bk, 208 So. LaSalle	6 yrs.	21	-	-	Steel B & G.			One Scaling slightly-some pitting.	
7.	Hotel Planters, 19 No. Clark St.	7 yrs.	9	22	12	12 Steel G.			9-Scaling at top, 3 good as new	
8	Otis Building 10 So. LaSalle	7 yrs.	16	32	10	10 Steel G.			Scaling at top; galvanizing partly destroyed.	
9	City Hall.	7 yrs.	11	42	16	Steel G			Scaling Badly.	
10.	Hotel Sherman 156 No. Clark.	8 yrs.	15	33	18	18 Steel G.			12 Scaling Slightly: 3 scaling badly; 3-galvanizing attacked.	
11	Hotel LaSalle	9 yrs.	18	33	14	2-W.I.G. 10 Steel G.		Galvanizing destroyed. but otherwise good.	Nearly all scaling badly at Top.	Two Steel vents were added 1914 and are still good as new.
12.	Cook County Building	10 yrs.	11	34	15	17 Steel G. 17 Steel B.			8-75% Destroyed: 9-50% Destroyed: 17-Galvanizing scaling badly	1-5" Line clogged up with rust below roof

TABLE I - CONT.

Sheet N°2

All lines are black unless otherwise indicated Letter G means galvanized Letters XH and S after cast iron mean extra heavy and standard weight respectively.

Investigation N°	Name and Location of Building	Age of installation	N° of Stories	Total N° of Vents	Vents Tested	Pipe Material	CONDITION of VENTS			Remarks.
							Cast Iron	Wrought Iron.	Steel	
13.	Daniel Hayes 109 N° Dearborn	10 yrs	13	8	5	Steel G			3-Good as new. 2 Scaling.	
14	Corn Exchange 134 So LaSalle	10 yrs	17	36	7	Steel B			All scaling badly; ¼ to ½ gone.	
15	Great Northern Hotel, Jackson and South Dearborn	10 yrs.	14	39	8	1 W I B 7 Steel B		Scaling 25%	Most lines over 75% destroyed	Tested 2 Cellar drains. Black W I. installed 1892; pitted, but no leaks.
16	Edison Bldg 125 So Clark	11 yrs	19	66	15	9-Steel G, 6 Steel B; 6 C I	Good		Galvonizing scaling at top. Black lines about 75% destroyed	
17	Tribune Bldg 7 So Dearborn.	12 yrs	18	76	6	1-W I G. 5 Steel G		Good as new	About 50% destroyed by scaling	One drain tested - black steel apparently good
18	Fisher Bldg 343 So Dearborn	12 yrs	20	13	6	6 Steel G			Starting to Scale	
19	Borland 105 So LaSalle St	13 yrs	19	-	-	Steel B & G.			2 Lines destroyed in 10 yrs.	
20.	Standard Trust & Savings Bk. Monroe & Clark	13 yrs	14	23	4	4 W.I.		All Vents pockmarked, but good.		
21	Fort Dearborn Bank, 74 West Monroe	13 yrs.	18	32	5	4-Steel B. 1-Steel G 3-C.I.	Good as new		All 32 lines Scaling badly Most over 50% destroyed.	1-Vent (4" G Steel) installed as relief vent 1910: Still good.
22.	First National Bank. Monroe St	14 yrs.	18	86	4	4-Steel B			About 50% destroyed by Scaling	32 Lines (Not tested) in same condition as those tested.
23.	Rector Bldg Monroe & Clark.	14 yrs.	14	20	7	7-Steel B			All but one line nearly destroyed by scaling	
24	Republic Bldg 209 State Street	16 yrs.	19	22	6	6-Steel G			Galvanizing nearly gone some Scaling.	2-cellar drains rusted out & replaced. Another line is rusted thru in 2 places all these are Steel.

TABLE I - CONT. Sheet No 3.

All lines are black unless otherwise indicated. Letter G. means galvanized Letters XH and S after cast iron mean extra heavy and Standard weight respectively

Investigation No.	Name and Location of Building.	Age of installation.	No of Stories	Total No of Vents.	Vents Tested	Pipe Material.	CONDITION of VENTS Cast iron.	Wrought iron.	Steel	Remarks
25.	National Life Building. 29 So. LaSalle.	16yrs.	13	20	7	6-Steel B. 1-W.I B.		1-Scaling slightly	4-Vents 50% destroyed. 2 Vents only thin shell left	
26.	Merchant Loan and Trust 140 So. Clark.	18 yrs.	12	41	9	2-W.I.B. 7-Steel B; 4 C.I.	Good	Scaling slightly.	Scaling badly nearly destroyed over 50%.	
27.	Ashland Block 201 No Clark.	20 yrs.	16	3	3	3 Steel.			Gone to a shell.	
28.	Straus Bldg. 6 No Clark.	21 yrs.	10	10	5	Steel B.			Scaling badly 1/4 to 3/4 gone.	Black Steel 6" drain in cellar (suspended) hole rusted thru. on top.
29.	Portland Building. 35 No Dearborn.	21 yrs.	6	15	2	2-W.I. 13-C.I.	3-Good; 8-Pitted; 2-Scaling badly 50 to 90%.	About 25% destroyed.		6-Cast Iron Vents clogged with rust at increaser below roof.
30.	Fisher Bldg. 343 So. Dearborn.	22 yrs.	20	19	10	10 W.I.		Scaling badly		
31.	Marquette Building. 140 So. Dearborn.	24 yrs.	17	34	7	5-Steel B. 2-W.I.B.		Pockmarked but good.	Scaling badly. Only a thin shell remaining of 3 vents	
32.	New York Life. 39 So. LaSalle.	24 yrs.	14	40	6	4-W.I.B. 2-Steel B; 2 C.I.	Scaling down inside.	3-Scaling slightly; 1-25% destroyed.	1-Nearly destroyed; 1-Painted at top.- good.	Have had to recalk several leaky joints on C.I. drain. Two joints now require repairing.
33.	Western Union. 300 So. Clark.	23 yrs.	11	6	1	6-C.I.	Good		A 5" Steel vent was installed 1909 Scaling slightly	
34	Chicago Stock Exchange 30 No LaSalle.	25 yrs.	13	19	11	9-Steel B			Practically destroyed some replaced.	Galvanized steel used for vents replaced.
35.	Teutonic Bldg 79 W. Washington St.	26 yrs.	10	11	6	3-W.I 3-Steel		Scaling badly	Scaling badly. nearly gone at roof	
36.	Boyce Bldg. 30 No Dearborn.	24 yrs.	12	13	-	13-C.I.	Nearly all pockmarked & scaling.			

TABLE I - CONT. Sheet No 4.

All lines are black unless otherwise indicated. Letter G. means galvanized. Letters XH and S after cast iron mean extra heavy and Standard weight respectively.

Investigation No.	Name and Location of building	Age of installation.	No of Stories.	Total No of Vents.	Vents Tested	Pipe Material.	CONDITION of VENTS Cast Iron.	Wrought Iron.	Steel	Remarks
37.	Oxford Bldg. 118 So. LaSalle.	26yrs.	8	29	-	29-C.I	Over 50% destroyed some completely gone			
38.	Monadnock Block. 53 E. Jackson.	27 yrs.	17	39	10	W I B.		Pitted, but in good condition.		General condition good. Pitting deep in some lines.
39	Ashland Block 201 N. Clark.	26 yrs.	16	20	20	20-W.I.		Scaling slightly.		
40.	Unity Building 127 No Dearborn.	27 yrs.	16	23	6	5. W.I.B. 1. Steel B.		3-good (painted); 2 about 25% loss.	Completely corroded & broken off.	Length of 6" cellar drain of Steel replaced 1918. Due to rusting thru.
41.	Tacoma Bldg. 5 No LaSalle.	30 yrs.	12	6	3	1-C.I. 5-W.I.	Slightly pitted	Pitted over inner surface		Pipe generally in good condition.
42	Chicago Title & Trust. 69 W. Washington.	27 yrs	16	21	-	21-C.I.	19-Pockmarked and scaling; 2 good as new			
43.	W.C.T.U 108 So. LaSalle.	28 yrs.	12	-	2	W.I.		Pitted but good.		
44.	Old Colony 37 W Van Buren.	28 yrs.	16.	19	2	W.I.B.		Evenly pitted on inner surface.		
45.	Masonic Temple 159 N. State.	28 yrs.	21		4.	W I.		All in good condition.		Could not get on roof.
46.	Caxton Bldg. 508 So Dearborn.	28 yrs.	12	6	-	C.I. XH.	Slightly pitted.			Vents visible and in good condition.
47.	Chamber of Commerce Bldg. 133 W Washington.	28 yrs.	14	17	10	W.I.		Good. 3-about 50% destroyed at top.		
48.	Monon Bldg. 440 So Dearborn St.	28 yrs.	13	13	7	6-C.I. 1-Steel B. 6-W.I.B.	4-good; 2 pockmarked	1-good; 5-from 50 to 75% destroyed	1-75% destroyed	
49.	Chemical Bldg. 117 No Dearborn Street.	29 yrs.	7	10	10	9-W.I.B. 1-Steel B:		All in good condition.	1-gone to a shell.	
50.	Bedford Bldg. 203 So. Dearborn St.	29 yrs.	13	3	2	2. W.I 1. C.I.	Good.	1-Good 1-50% rusted.		Cast iron drain leaked & was replaced about 1906.

a heavy coat of paint or a coat of rust, was filed away and filings of the clean metal procured. These samples were sealed in individual envelopes and numbered, the numbers on the envelopes corresponding with the numbers on the investigation reports describing the condition of each waste, vent, drain or soil pipe, together with the name of the building.

Chemical Test of Pipe

All samples were tested by the so called manganese test, a very simple qualitative chemical analysis which may readily be performed by anyone having the necessary inexpensive outfit.

In the manufacture of steel pipe, it is well known that to the molten metal in the Bessemer retort a certain amount of ferro manganese is added in order to make it possible to roll and weld the over-oxidized metal. There is no such addition of manganese in the manufacture of wrought iron. The latter metal contains only a very insignificant amount of manganese, such as may have been contained in the original ore. In making this manganese test, each sample of filings is placed in a glass test tube. The amount need only be a few grains. To this is added, 10 drops of nitric acid, diluted with an equal part of water. The solution is then heated for a few seconds over a flame and allowed to cool off. When cooled, a small amount of sodium busmuthate is added. If the sample is steel, a decided pink color will show. If it be wrought iron, the solution will show a light brown color, which gradually fades away, leaving a brownish residue in the bottom of the tube. In several cases, these tests were supplanted by fracture tests, which furnish a conclusive check on the manganese test. Wrought iron fractures show a fibrous character of metal, and steel a brilliant crystalline one. For the purpose of these investigations, the tests outlined answered the purpose.

Data Collected

The table herewith contains a brief summary of the data collected, showing the name and location of each building, the age of pipe installation, the total number of roof terminal vents, number of screw pipes tested to determine whether of wrought iron or steel, and the condition of all pipes with respect to corrosion at time of investigation.

Altogether, 63 buildings were investigated, in all but two of which more or less complete data were obtained. In age, these buildings range as follows:

	Buildings
30 years ago	13
25-29 years	18
20-24 years	6
15-19 years	3
10-14 years	12
8 years or less	11
	63

Dividing these buildings, according to the kind of pipe used in their drainage systems, we find:—

	Buildings
1. Cast iron in	15
2. Wrought iron	8
3. Steel	19
4. Mixed W. I. and steel	11
5. C. I. mixed with W. I. or steel	10
	63

Photographs

A number of photographs were obtained in an effort to show the average condition of terminal vents. Unfortunately, many of these photographs leave much to be desired in clearness, something which is principally due to the lead coping entirely covering the exterior and top of the pipe above the roof. It is, therefore, difficult to depict the interior corrosion, as this is usually best revealed by the thinness or thickness of the pipe around the edge at the top. Only to a smaller degree is the degree of corrosion indicated by the flaking or pitting of the interior surface, as a thin crust of rust flakes in a photograph does not look much different from a heavy crust of rust flakes.

Installations over 20 years old

Pipe	Total Number	No. of vents entirely or nearly destroyed.	Estimated percent. destruction.
Steel	33 vents	All practically destroyed	90%
Wrought Iron.	155 vents	17 vents nearly destroyed	20%
Cast Iron	218 vents	43 vents nearly destroyed	25%

TABLE I - CONT. Sheet No 5.

All lines are black unless otherwise indicated. Letter G. means galvanized. Letters XH and S after cast iron mean extra heavy and Standard weight respectively.

Investigation No.	Name and Location of building.	Age of installation.	No. of Stories.	Total No. of Vents	Vents Tested.	Pipe Material	CONDITION of VENTS: Cast Iron.	Wrought Iron.	Steel	Remarks
51	Grace Hotel 301 So. Clark	30 yrs	9	28		28 C.I.	15 vents clogged up with rust all lines pitted			C.I. drain stopped up and cleaned out.
52	McCormick Bldg 143 N° Dearborn.	30 yrs	10	4		C.I. XH.	4 Pitted, Stopped with rust.			Clogged up with rust
53	The Rookery 209 So LaSalle	30 yrs	12	12		C.I. X.H.	Pitted but in good condition.			Drain in cellar W.I. Apparently good.
54	Provident Building. 266 LaSalle.	34 yrs	12	4	2	C.I. 2- W.I.	Pitted and scaling badly.	1- Scaling. 1- Pitted.		1- galvanized line appears relatively new.
55.	301-11 Michigan Ave.	35 yrs.	7			C.I. S.				Front half of Bldg. wrecked pipe samples in good condition.
56.	Watson Bldg. 17 N° LaSalle.	35 yrs.	8	6		C.I. XH.	Pitted.			
57.	Home Insurance Bldg. 137 So LaSalle.	35 yrs.	12	12		C.I. XH	Pitted but in good condition.			
58.	Counselmen Bldg. 234 So. LaSalle.	35 yrs	9	8	8	8 W.I.		5- Good as new 3- pockmarked		
59.	Gaff Bldg. 320 So. LaSalle.	35 yrs.	9	8	1	7- C.I. 1- W.I.	3- Pockmarked; 4- painted (good).	1- Pockmarked.		Joints on C.I. drain forced out.
60.	3501. S. State.	40 yrs.	3			C.I.	Badly Pitted.			Large hole in 4" Soil vent over "T"
61.	Hoyne & Co. Building. 112 N° La-Salle.	45 yrs.	4		2	C.I. & W.I.	2- rusted through & Scaling	3- good condition		
62.	Union Bank 35 N° Dearborn.	45 yrs.	8	20	20	5- C.I. 7- W.I. B 3- W.I. G	Pockmarked but good.	14- Pockmarked but good. 2- Scaling.		C.I. Drain in boiler room has leaky joint.
63.	Merchants Bldg. 106 N° LaSalle.	46 yrs.	6	6	-	8- C.I.	Pitted and scaling.			Bed erected 1872, but pipe evidently of more recent date.

10 to 19 Years Old

Pipe	Total vents	Present condition	Percent. depreciation black pipe.
Steel	101g.	Galvanizing 25% destroyed	....
Steel	144b.	Black—all scaling badly	75%
Wrought iron.	28	Both black and galvanized good..	10%
Cast iron	13	All good	10%

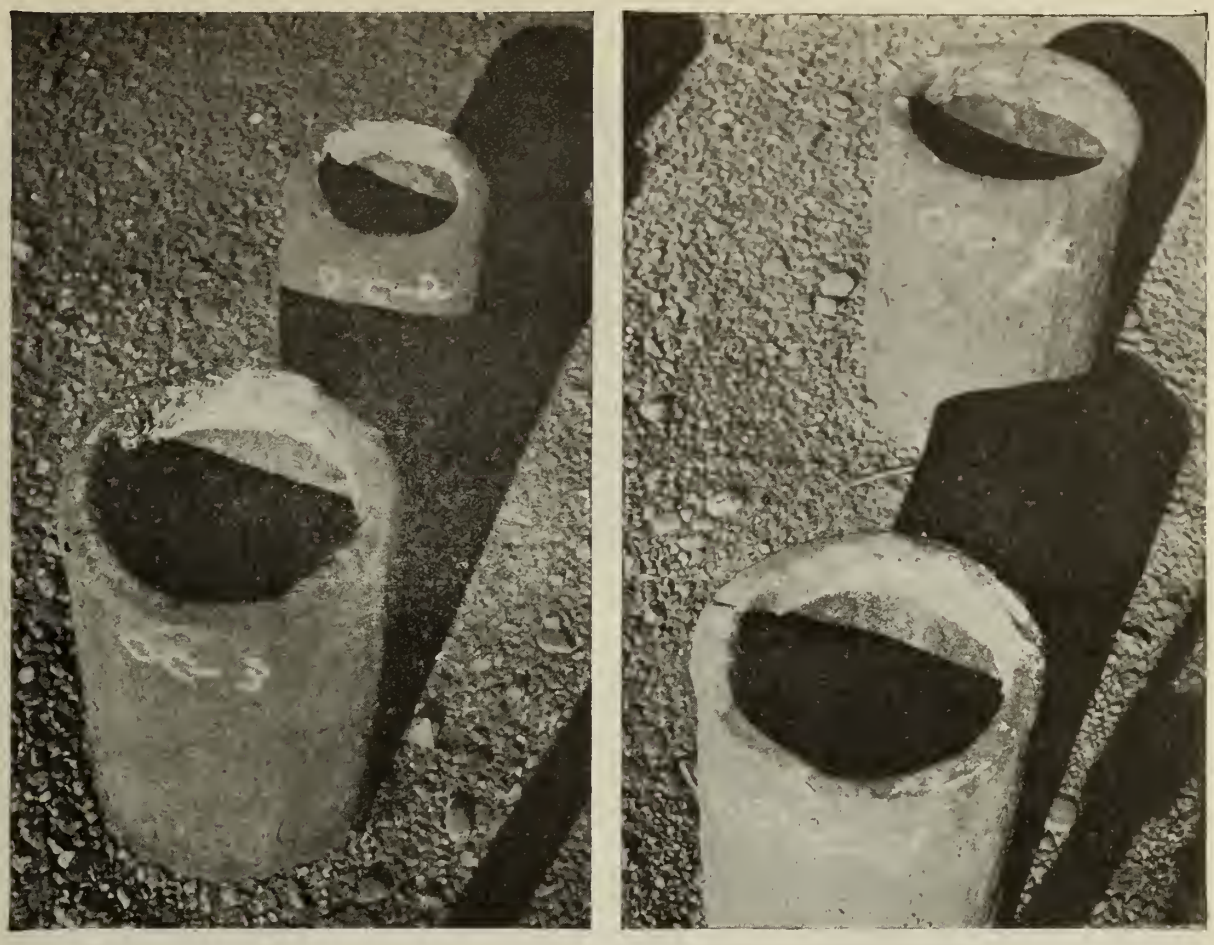


Plate No. 4

Wrought Iron, 28 years old

Old Colony Building, Chicago. The black wrought iron vents—19 in all—are in good condition.

Steel Pipe, 7 years old

City Hall, Chicago, Ill. Erected 1911. 42 galvanized steel vents already scaling badly.

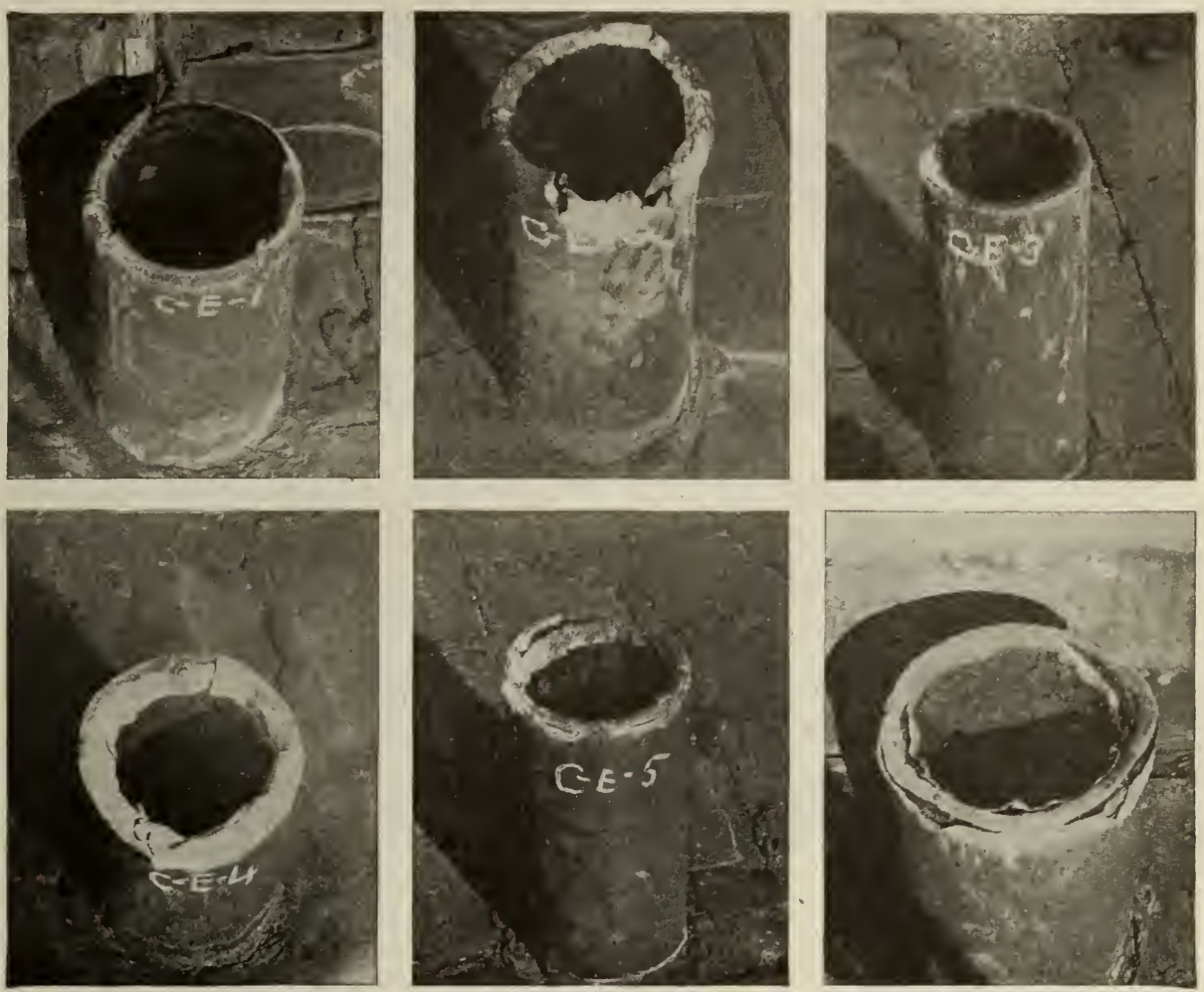
Plate No. 5

Plate No. 6

Steel Pipe, installed 1908, Cook County Bldg., Chicago

All the black steel vents on this building are from 50% to 75% destroyed by corrosion. 17 galvanized steel vents on same roof are already scaling badly. All 10 years old.

Plate No. 7



No. 1—Scaling badly.

No. 2—Almost destroyed, only thin shell remaining.

No. 3—About 25% destroyed.

No. 4—Almost destroyed, only thin shell remaining.

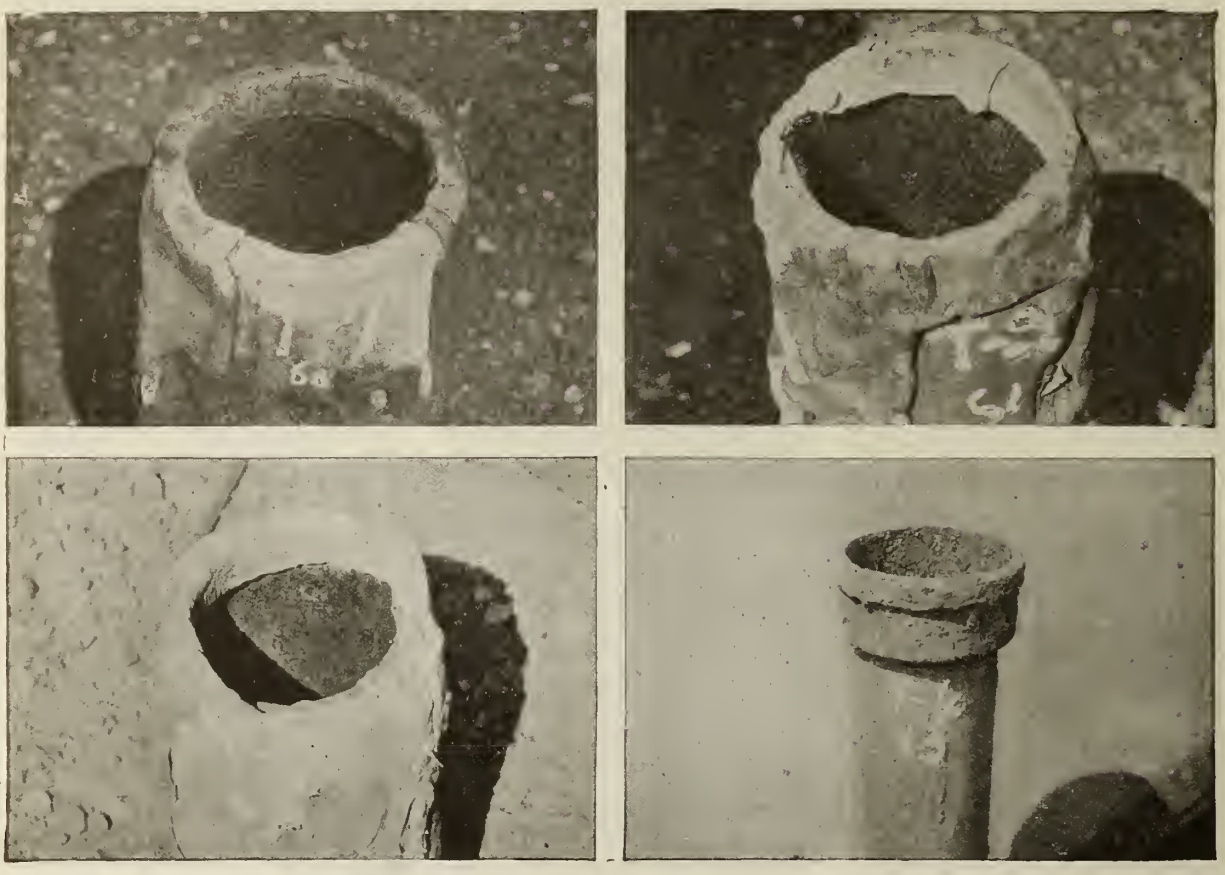
Nos. 5 and 7—About 25% destroyed.

No. 6—About 50% destroyed.

Note:—Although vent No. 7 is in a better condition than most of the others, it shows the severe corrosion more clearly due to the removal of the coping at the top. All of these vents are only 10 years old, and of black steel.

Steel Pipe, installed 1908, in the Corn Exchange Bank Building, Chicago, Illinois

Plate No. 8



Wrought Iron after 30 years' service, Tacoma Building, Chicago. Erected 1888

All the black wrought iron (as well as the cast iron) vents on this building in an excellent condition. Slightly pitted, but very little loss in thickness.

Hence it is necessary to note the descriptions under most photographs of pipes in order to get a beter idea of their actual condition.

Tabulated Records of Pipe Corrosion In Buildings Investigated

Note: Letter g after the words "iron" or "steel" means galvanized. Letter b means black. Where no letter is appended, it is understood the pipe is black. Letters X and S after cast iron, mean "extra heavy" and "standard weight," respectively.

Rating of Cast Iron, Wrought Iron and Steel

If we analyze the records for all systems over 20 years old, as recorded in the table, and also in the individual reports which are too voluminous to be embodied in this report, we find that a total of 33 roof terminal vents were steel, 155 wrought iron, and 218 cast iron. If we now attempt to summarize as far as possible the condition of ail these vents, we find the interesting facts as per table following:

Installations Over 20 Years Old

The poorer rating for cast iron in comparison with wrought iron, as shown in this table, is, to some extent, due to the probable higher average age of the cast iron installations. The comparison refers only to destruction or near-destruction by corrosion, and does not take into account several dozen cast iron vents which had clogged up with rust at the increaser below the roof and thus become temporarily useless. Neither does it take into account the condition of the joints, which would further improve the rating of wrought iron over cast iron. Steel pipe, it will be noted, is so completely destroyed by corrosion after 20 years, as to exclude all consideration of joints or clogging, which might otherwise be figured in its favor.

Buildings From 10 to 19 Years Old

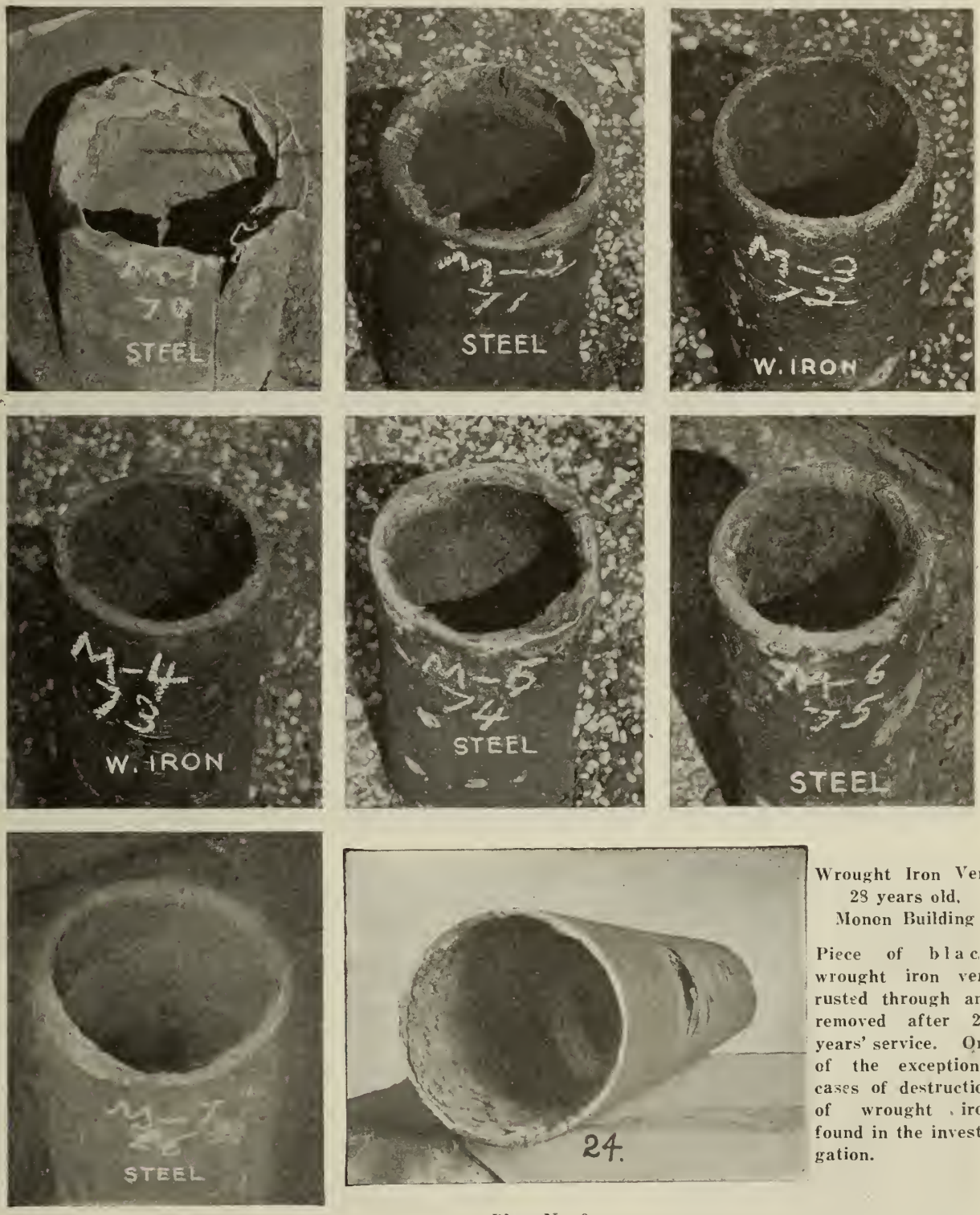
Turning now to buildings from 10 to 19 years old, the table exhibits a large number of steel installations, indicating how completely steel pipe, on account of its slightly lower first cost, has come into use in Chicago. A rating table, compiled along the lines just described, but distinguishing between black and galvanized pipe, follows:

10 to 19 Years Old

With reference to galvanized steel pipe, it appears that galvanizing is partly or wholly destroyed before the pipe is 15 years old, protecting it from destruction to this extent, the pipe, as

Plate No. 10

WROUGHT IRON AND STEEL PIPE, INSTALLED 1894—MARQUETTE BUILDING, CHICAGO



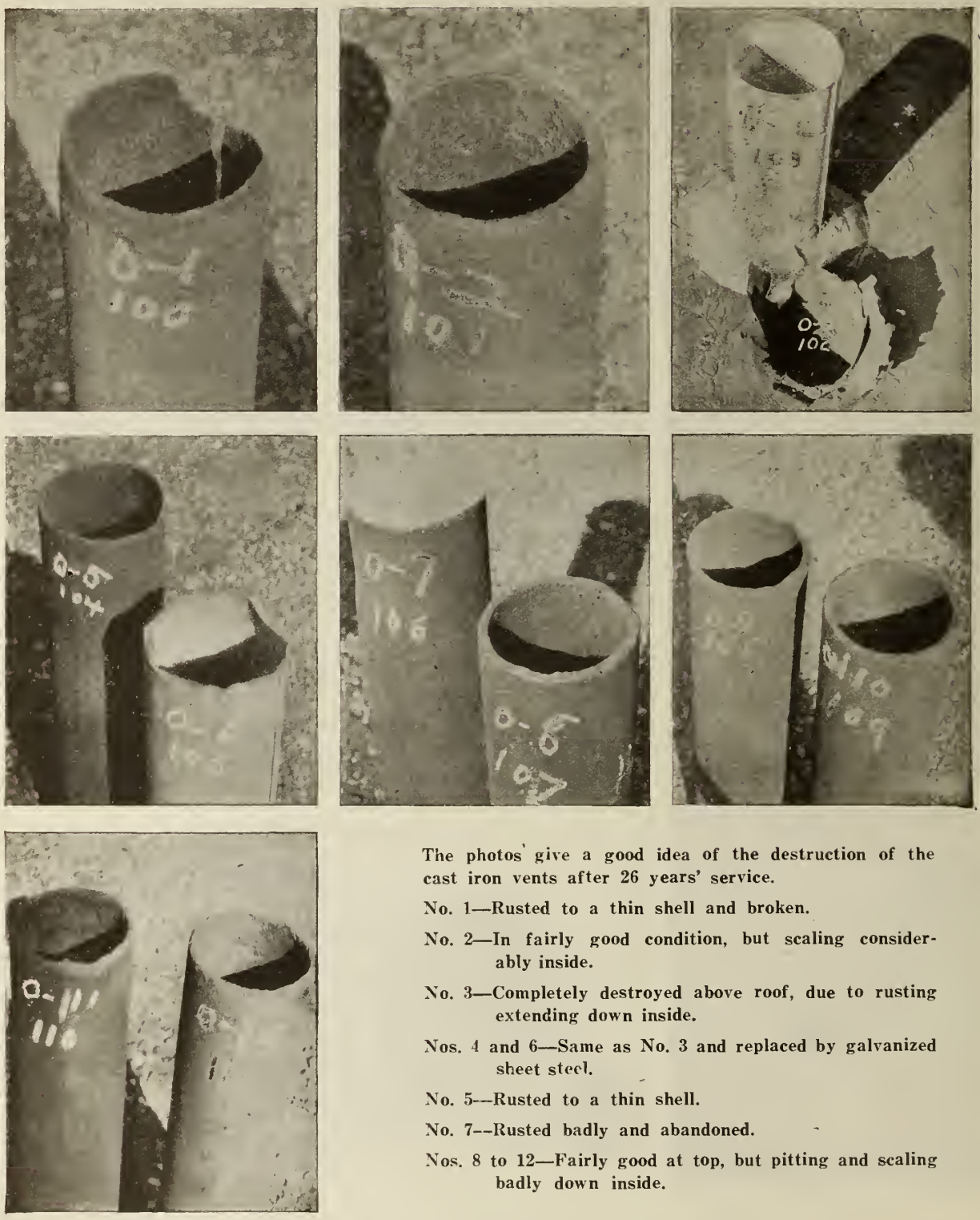
Wrought Iron Vent 28 years old, Monon Building

Piece of black wrought iron vent rusted through and removed after 28 years' service. One of the exceptional cases of destruction of wrought iron found in the investigation.

Plate No. 9

Nos. 1 and 2—Nearly destroyed (steel b). Nos. 3 and 4—Pitted, but in good condition (wrought iron b). Nos. 5 and 7—Scaling badly, from 50% to 80% destroyed (steel b). No. 6—Scaling badly (steel b).

Plate No. 11



The photos give a good idea of the destruction of the cast iron vents after 26 years' service.

No. 1—Rusted to a thin shell and broken.

No. 2—In fairly good condition, but scaling considerably inside.

No. 3—Completely destroyed above roof, due to rusting extending down inside.

Nos. 4 and 6—Same as No. 3 and replaced by galvanized sheet steel.

No. 5—Rusted to a thin shell.

No. 7—Rusted badly and abandoned.

Nos. 8 to 12—Fairly good at top, but pitting and scaling badly down inside.

CAST IRON, INSTALLED 1892, OXFORD BUILDING, CHICAGO

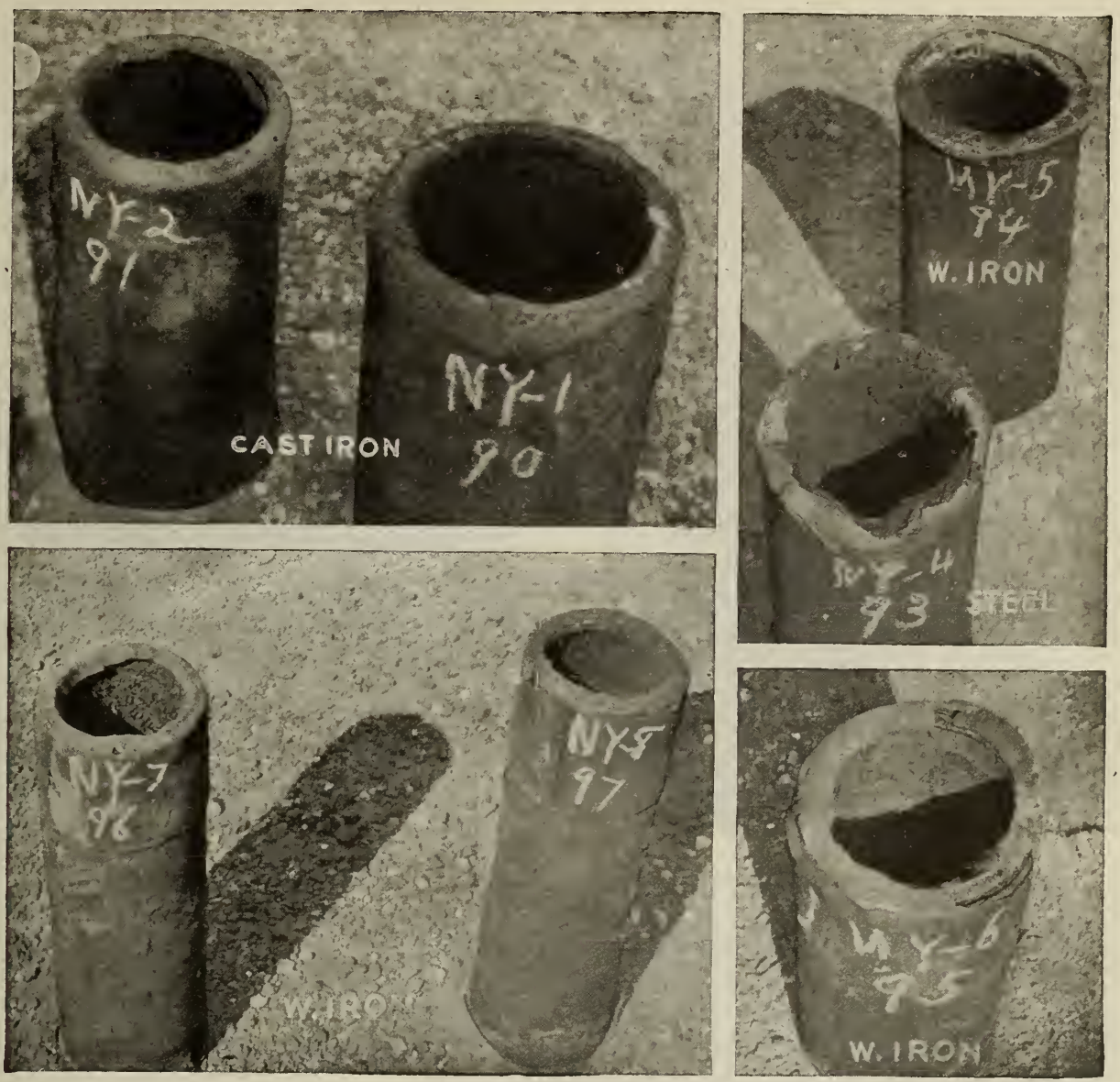


Plate No. 12

2 cast iron scaling down inside; 3 wrought iron scaling slightly; one wrought iron 25% destroyed. 1 steel (No. 93) nearly destroyed.

All the above vents are 24 years old, installed in the New York Life Building, Chicago.

CAST IRON, WROUGHT IRON AND STEEL IN THE SAME SERVICE

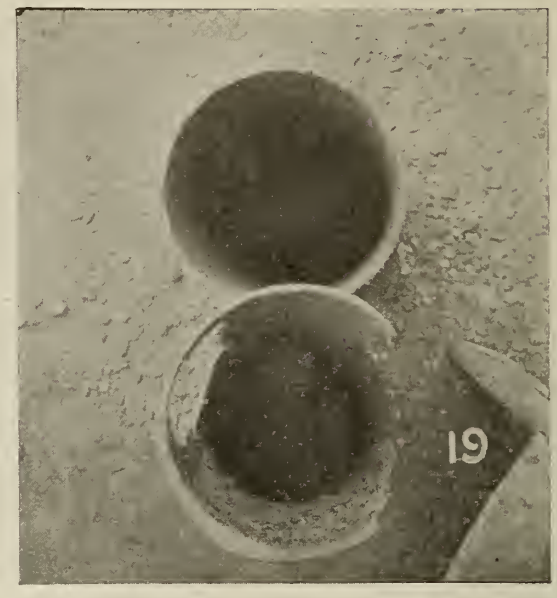
a result, lasting from 15 to 25 years before complete destruction is observed. The relatively good condition of wrought iron, both black and galvanized, should again be noted. The 10 per cent. given in the table for both wrought iron and cast iron indicate a slight depreciation, but no actual failures.

Buildings Less Than 10 Years Old

In perusing the tabulation, one is struck by the fact that the severe corrosion of steel pipe becomes evident even before the building has passed its first decade of existence. Notable examples are the Cook County Building, 10 years old, with 34 steel vents, about half of them galvanized. Further, the City Hall, 7 years old, with 42 steel vents, all galvanized, but in spite of this, all scaling severely. This does not lend substance to the oft repeated claims concerning the marvelous improvement of steel pipe in recent years. If anything, these new installations seem to be relatively worse than the older ones.

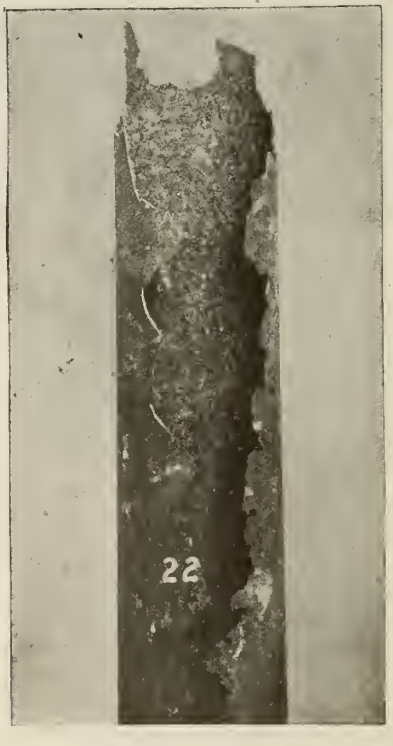
All Corrosion Internal

If the destruction of the different kinds of pipe mentioned was confined to the roof line or the space immediately below it, there might be some grounds for believing that sulphuric acid gas from burning coal would be the destructive element. This, however, is not the case, as the corrosion is mainly from the inside of the pipes. In the Borland Building, the soil, waste and vent pipes at the third and fourth floor levels were entirely rusted away, while the same lines of pipe near the roof were practically as good as when installed. In the Unity Building a wrought iron waste line from urinals was rusted out



Cast Iron vents, Hoyne Building, erected 1873. 112 No. La Salle St.

Cast iron rusted, broken and filled up with rust. 3 wrought iron pipes on same roof are in good condition. (Some doubt as to age of installation. It is supposed to be about 30 years old).



3501 S. State Street, Chicago.

4" standard cast iron, just above the top Tee in bathroom. Supposed to have been installed in 1875. Completely destroyed by corrosion.

Note:—The installations illustrate that cast iron is not immune to corrosion, even though it usually gives very satisfactory service from a corrosion standpoint.

Plates Nos. 19, 20, 21, 22

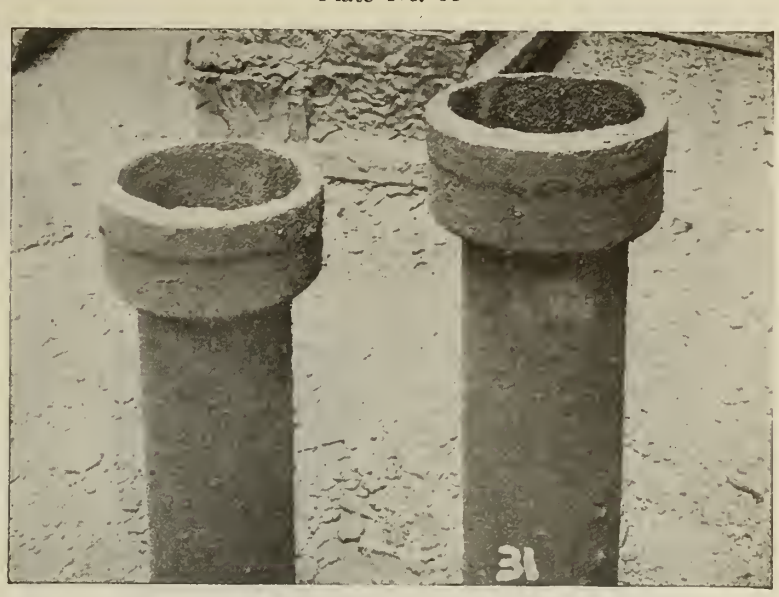
entirely from the third floor up. In the Great Northern Hotel building it was found during the process of reconstruction of bath rooms about ten years ago that the old pipe system of waste and vent pipes was entirely destroyed at the threads, and over practically the entire length of the pipe in many places. In other instances drains hanging on the basement ceiling had rusted through and had to be replaced and branch soil and waste pipes on intermediate floors were subject to the same deterioration from internal corrosion. So it is clear that the agency causing corrosion is not from the atmosphere above the roof, but is due to the gases developed within the plumbing system itself and from the sewer in the street.

It is recognized that in downtown Chicago the main street sewers are too small, a condition which is made worse by the fact that they are elevated but a few feet above the lake and river outlets, giving a very sluggish flow. The street sewers have been found full of water well beyond midnight, when repairs are usually made without difficulty in other cities. Further, the pipe sizes used in vents and wastes in large buildings generally are too small and skimpy, resulting in blowing out of trap seals and in syphonage of fixtures. The conditions noted with respect to sewers long since caused the main house trap to be abandoned, the sewers and house drains being ventilated through the plumbing system. The sewers are also ventilated by means of man holes in the street. Altogether, there can be no question but what these conditions combine to aggravate the corrosion in pipes in this city, for although corrosion of drainage piping is severe everywhere, it appears to be about 50 per cent. worse in Chicago than in New York and other cities. We discovered in the course of the investigation considerable evidence indicating how to improve the service obtained from the pipe system, both in respect to proper functioning of fixtures and pipes, and lessening of corrosive attack.

Height of Vents Above Roof

The general practice in Chicago is to extend the vents about one foot above the roof, while in New York City, vents on large buildings are usually from 7 to 12 feet above the roof. Very few people can furnish a satisfactory explanation of this difference in practice. I think the case of the Standard Trust & Savings Bank building in Chicago explains the reason. In this building trouble was experienced with syphoning of fixtures. It was thought to be caused by the suction of winds sweeping over the roof, preventing the free influx of air to the vent to relieve the vacuum in the wake of water rushing down the pipes. Galvanized sheet steel extensions about 5 feet high were therefore fitted to the top of the vents, with the result that the trouble was completely eliminated. The extension also is to be recommended because it serves to keep the exceedingly strong fumes from being inhaled by workers or occupants of the roofs and pent houses.

Plate No. 31



Extra heavy Cast Iron, 30 years old, McCormick Building, Chicago
Showing typically good condition of cast iron after 30 years' service.

Vent Increased at Roof

City ordinances in Chicago demand that the size of vents and soil stacks be increased from a point directly below the roof to the top of the pipe, to prevent hoar frost from closing up the pipe in cold weather. Unfortunately, this causes rust and dirt falling down the pipe to find lodgment at the increaser, clogging up the pipe and de-

(Continued on page 34)

Plate No. 32

Roof of Standard Trust & Savings Bank
To overcome siphoning of fixtures, the vents were extended about 5 feet above the roof by means of temporary galvanized sheet tubes. This remedied the trouble. (See paragraph "Height of vents above roof.")

THIS PLANT IS A
THE WHOLE

This style of laundry tub is tapped so that all bibbs are below the covers when closed.

The very tub for a kitchen, where the covers can be used for table or for folding clothes on, etc.

The iron legs suggest both strength and neatness when this tub is installed in the kitchen.

THE "ARISTOCRAT"

WE CARRY LARGE STOCKS

We carry one of the largest and most complete stocks of plumbing goods. Cast iron enamelware, porcelain ware, brass goods and other sanitary specialties. We handle cast iron soil pipe and fittings and septic tank syphons for country sewage disposal systems. And we can make prompt deliveries to any part of the Dominion.

WE MANUFACT
Uniform in Thi

W. G. HARRIS, Senior President.

SOLDER FOR EVERY PURPOSE

Regarding Solder. We believe we have the finest line of solders on this continent and the reason why we make this assertion is: First, we mix all our metals to formulæ based upon the very best scientific practice. Second, we seldom have a single complaint from those who are using it every day, and third, because we have a large variety of both wiping, bar and wire. Solders that in form and quality are suitable for every purpose known.

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WE HAVE EVERYTHI

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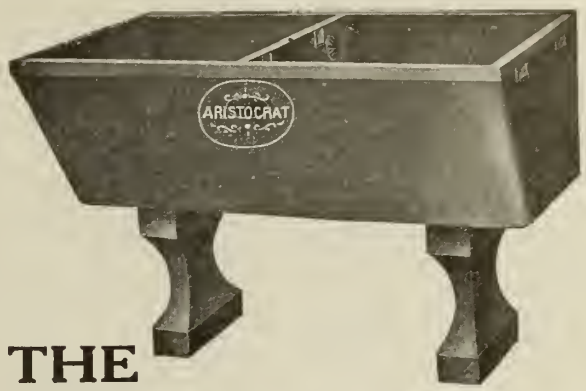

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You cannot procure a better and more dependable line of sheet lead on the continent than we make. Even in thickness and quality, and in any size or weights. Ask us about our flashing lead, it works up easily and will not crack. Our lead waste pipe, too, is one of the best recommendations we have.

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Now. With such a plant at your disposal and with such an efficient staff we feel sure that you will agree with us that we can give the trade of the best in material, and the very best in service.

We only ask you to place us on trial and we are willing that you be both judge and jury. Surely that offer is fair, and do not forget that we have everything for the plumber; just ask us.

W. G. HARRIS, Junior Vice-President.

OMPANY, LIMITED
TO Winnipeg Vancouver
G FOR THE PLUMBER

INVESTIGATION OF CORROSION

Continued from page 31

feating the purpose of the ordinance. This tendency to clogging is noticeable everywhere, even in cast and wrought iron pipe installations. The type of fitting now used as an increaser has a more gradual taper than that formerly in vogue, but the tendency to clogging can hardly be eliminated. The remedy would seem to be in the adoption of larger sizes of pipes, all the way down through the building, and if increasers are used, they should never be over 1 in taper. It would seem far preferable to have the hoar frost closing up the pipes for a few days in extremely cold weather than to have the pipes permanently clogged up with rust and dirt.

Proportioning Pipes to Suit Number and Size of Fixtures

In a certain building there were over 40 closets on the 17th floor, besides lavatories and urinals. All these fixtures discharged into a 6 in. stack. During rainy weather, the rain water emptying into the main house sewer, added to the discharge from the 17th floor toilet rooms, would cause trap seals to be blown out and waste water overflowing from fixtures on lower floors and in basements. This trouble was overcome by the installation of an extra relief vent, but it would be far cheaper in all buildings to prevent costly and annoying occurrences of this kind by employing in the first installation pipe of larger sizes for both soil stack and regulation vent.

Leaky Cast Iron Joints

From the standpoint of sanitation, one leaky pipe is as bad as another, regardless of what causes the leak, be it corrosion or merely the giving way of a joint from expansion and contraction.

Although the tabulation embodied in the report does not make specific mention of the fact, many instances of leaky caulked joints were observed and unquestionably many also escaped our attention, being more or less inaccessible. Many joints also had been recaulked, but it is, nevertheless, a regrettable fact that leaky caulked joints are not always readily discovered and even less frequently repaired with promptness, in the meantime permitting the escape of gases of a noxious, if not dangerous, character. Unquestionably, the screw joint is to be preferred from this standpoint, as long as it can be obtained without sacrifice of the necessary rust resistance of the pipe material.

Steel Pipe

If satisfactory service from black and galvanized steel pipe is only obtained for a relatively brief period of five to fifteen years, and our ordinances do not differentiate between such pipe and wrought iron, I believe we are not playing fair with the public, who pays the bill. The evidence against steel pipe is as indisputable as to admit of no contention. I am firmly convinced from what has been demonstrated in this investigation, that there is a most decided difference between steel and wrought iron for such purposes as are necessary in a sanitary plumbing system, and that we should recognize that fact and in the writing of ordinances, laws or specifications we should provide that steel pipe be not used in any buildings except those of a temporary character.

REFUND ON PLUMBERS' LICENSE RECOMMENDED

The legislative committee of the Calgary city council at a meeting held recently decided to recommend to council a refund of four dollars on each license paid during 1918 by plumbers, gasfitters and steamfitters. Considerable discussion has taken place during the past few months on this subject, and a short time ago it was decided by the committee to change the license fee in these trades from five dollars to one dollar. It was the intention of the committee at that time to have this change go into effect on January 1, 1919, but at this meeting a delegation from the plumbers' union waited on the committee explaining the injustice of a journeyman in these trades being compelled to pay $21 before being allowed to engage in any work. The committee, after looking at the matter from all angles, decided that a refund of the money which had been paid by the men in excess of the former fee was due them. This will consequently be recommended to the council. Since one-half of the plumbers concerned are employers in business, the license money which is refunded to them will be paid back to the city in business tax, so that, according to the chairman of the committee, the entire refund will not total more than $150 or $160.

RETURNED SOLDIERS PASS EXAMINATIONS OF ROYAL SANITARY INSTITUTE

Through the co-operation of the Departments of Education and the Provincial Board of Health, examinations of the Royal Sanitary Institute for Sanitary Inspectors under the supervision of the Alberta Board of Examiners of the Royal Sanitary Institute, London, England, are now conducted in the Province of Alberta.

At a meeting of the Alberta Board of Examiners held in Edmonton, the following candidates were recommended for certificates to the Royal Sanitary Institute: Pte. Jas. Butterfield, Edmonton; Pte. Geo. P. Head, Metals Ltd., Calgary; Pte. David Evans Jones, Prov. Dept. of Public Health, Edmonton; Pte. Andrew J. Livingston, City Health Dept., Calgary; Pte. Wm. F. Lochead, Calgary; Pte. John MacDonald, P. Burns Co., Calgary; Pte. Ernest T. Phelps, Calgary; Walter G. Golding, City Health Dept., Calgary. The following candidates who sat for the April examinations have also been recommended for certificates: Pte. George Ernest Cottle, Provincial Dept. of Public Health, Edmonton; Pte. Edward Chas. Alexander, Provincial Dept. of Public Health, Edmonton; Pte. Jas. M. Jackson, City Health Dept., Calgary; Peter Maclean, secretary-treasurer, Gleichen.

It is interesting to note the excellent progress of the returned soldiers who have been trained at the Institute of Technology by the Vocational branch of the Invalided Soldiers' Commission. Some of these hold very responsible positions in the various health departments throughout the province, and during the past two months have rendered invaluable service in fighting the epidemic, especially in the rural districts. Many of them intend to pursue the higher course leading to the degree of R.S.

WHAT ARE CHANCES FOR BRAZIL'S TRADE?

Nearly all the electrical machinery now supplied to Brazil comes from the United States, although, before the war, a good deal was imported from Germany. The reason for Great Britain's poor showing can only be that our manufacturers have not sufficiently pushed the sale through suitable agents. The British Chamber of Commerce of Sao Paulo will be glad to place British exporters of electrical machinery, or any other goods, in touch with the right class of agents.

Files

The Americans have captured the file trade. Some years ago the files were supplied from Great Britain, but the Germans took the trade away in spite of the poor quality of their goods. The Americans followed the lead of the Germans, but produced a better quality file, with better packing, and captured the trade. Customs duties on files are paid according to weight; consequently the demand is for what is now known as "light weight" files. The Americans pack their files in neat cardboard boxes of half-dozen, dozen or more, depending on the sizes, whereas British makers continue to wrap their files in paper parcels in the old-fashioned manner, which parcels get torn in transit, the ends of the files stick out, rust and generally are less easy to handle.

SIZE OF COAL A FACTOR

In burning hard coal, the size should be carefully considered. Generally speaking, it is cheaper to use the finer grades, and in many plants "buckwheat" and "dust" coal are burned successfully and with good economical results. The main objections to the smaller sizes are that a much better draft is required to draw the air through the fuel-bed, and that a larger fraction of the coal is likely to fall unconsumed through the grates into the ash-pit, and so be wasted. To burn the smallest sizes with success, the draft should be powerful, and the grates should be chosen only after consultation with an experienced engineer who is familiar with the problems that are involved. Experimenting with very fine coal, without experience or competent advice, is likely to be expensive.

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INTERESTING AND VALUABLE INVESTIGATION

FOR some time SANITARY ENGINEER has been giving a lot of valuable data on pipe corrosion, etc. In the first place, it was reported that in quite a large number of buildings in which wrought iron pipe had been used it had given way and rusted through, etc., joints had broken at the threads, and so on.

These complaints came to us from a number of sources, and we therefore took no small amount of interest in the question. We secured pieces of corroded pipe from several sources and were given to understand that this pipe was wrought iron. We were furnished with copies of specifications which distinctly called for wrought iron pipe, and the architects were also given to understand this, or at least were not informed of the fact that other than wrought iron pipe was being installed.

However, the question became so very interesting, and of such value, both to manufacturers, supply men and members of the trade, that in a number of districts some very interesting tests were made. In Chicago, the sanitary engineering department at the city hall undertook to make a thorough investigation, and in New York, an investigation was conducted too.

The former investigation was conducted by Thos. J. Claffy, the assistant chief of the department. Mr. Claffy is a practical trained plumber and sanitary engineer, and has a staff of assistants, we believe, about the second largest in the world. Photographs were taken and data properly compiled, and as a result of this investigation much real matter was collected. SANITARY ENGINEER has been very fortunate in being able to procure the complete report and all the photographs, all of which appear in another portion of this issue.

Now, when SANITARY ENGINEER became interested in this question, it took it up with a view of showing that only such material should be used as was proving, by practical everyday experience, to be the best to use. Pipe was being sold and bought by the readers of SANITARY ENGINEER with the idea it was wrought iron pipe. But upon going into the matter SANITARY ENGINEER found that a lot of such pipe sold was not wrought iron pipe, but was pipe of inferior quality—in fact was made of a very doubtful mixture. There was also pipe sold that was and is steel pipe, and most of the samples of pipe sent in to SANITARY ENGINEER as wrought iron pipe turned out to be steel pipe. Of course this at once cleared the air. We have no doubt that this pipe of questionable quality has been the chief cause of the trouble, and therefore, we hope our readers will read the article which appears in another part of the magazine very carefully. We also hope that readers of SANITARY ENGINEER will refrain from installing any kind of material that cannot be depended upon to give maximum service, and we recommend that when buying black or galvanized iron pipe, wrought iron pipe be not only specified, but demanded. This is the only way to ensure the best results. When ordering pipe do not be satisfied to state, say, 500 feet of 1-inch B.I. pipe, or 500 feet of 1-inch galvanized pipe, but 500 feet of black wrought iron pipe. Furthermore, we would be very pleased to receive any information on this matter, so that cases of error, if any, can at once be nailed on the head. If a few of our readers, when ordering pipe, would send us a copy of their order and a sample of the pipe they receive, SANITARY ENGINEER will be only too pleased to have tests made. It has been proved without doubt in the investigation that steel pipe is not fit material for soil waste and drainage pipes, or ventilation pipes to soil waste and drainage systems.

TAKING PERSONAL STOCK

WITHIN the next few weeks many sanitary and heating engineers all over Canada will be taking stock. In doing this every member of the craft should not fail to take stock of himself, his men, his shop and the conditions of the tools his men have to use day by day. Some proprietors have found on looking into the matter that they are neglecting executive work which needs their urgent and personal attention to take care of work that could be done just as well by cheaper help. Others have found that other methods than those they were using are being applied by leading firms to boost business. Others have discovered opportunities for developing side lines which have turned out to be most profitable business builders. All these things are

worth looking into. Are you a better or more efficient salesman than you were a year ago? Are you keeping as closely in touch with your community and its needs as you should? Can your shop methods or the methods followed out on the job be improved? Stock-taking of this kind will often reveal points where improvements can be made that will make for increased business efficiency.

GERMANY'S LATEST PLAN

WHILE no attempts have as yet been reported since the signing of the armistice to unload German made goods in Canada, it is regarded as quite likely that some cleverly disguised plans for doing this are under way. It is believed that German agents are still very busy across the line and the American Defense Society has issued the following: "The subtle agents of Germany are here to place German goods on the market and ultimately undersell our own manufacturers. We have fought Germany on land and sea and now have to fight her at home. The cheap goods from Germany are made at slaves' wages. We must protect our own industries in order to give employment to our returning soldiers," Backing up this line of action several thousand stores, among them some of the largest in the States, are displaying signs which read "No German Made Goods Sold Here." In New York city alone, these signs are prominent in over 700 stores. There have been many rumors that German firms were not prepared to give up their foreign trade and would resort to every sort of scheme to unload their goods. It might be good policy for Canadian retailers to keep a weather eye open for German made goods.

Current Events in Photograph

BOOTY TAKEN FROM THE HUNS

Enormous quantities of supplies of all kinds have been falling into the hands of the British, French and American troops. At many points the Germans, encouraged by their successes in the early spring, concentrated millions of dollars' worth of war material of all kinds, intended for distribution among their men as they advanced. The Allies, however, have struck so hard and so often that in many cases these supply depots have had to be abandoned. Huge quantities of materials have been burned so that they would not fall into the hands of the advancing Allies. Other supplies have been blown up but in spite of all this the booty collected by the British and French is enormous. The photo shows some of the huge piles of war supplies that were taken undamaged.

War Time Plumbing in U.S.A.

Some Drastic Measures Adopted—Sanitary Plumbing Codes Not Recognized—By-laws Have to Go by the Board—Health Acts No Factor of Safety—Canada Must be Aware of the Bulk and Speculative Contractor

ABOUT five months ago we were at war, every country was trying its level best to conserve material of use for war purposes, and rightly so. The United States War Industries Board took some very drastic steps to conserve metals, without regard for municipal or state plumbing by-laws and all that these laws meant to the health of the people. No seamless tube was allowed to be made, or any tube of any kind heavier than 20 to 22 B. & S. gauge. No vented traps were to be made and no traps vented at all—all with a view of conserving brass and copper.

The sanitary plumbing trade was thrown into a panic, and not a few small municipalities, we have learned, were quite ready and willing to let plumbing by-laws go by the board. The War Board had to build thousands of houses for war workers. These were designed with cost as first and last thought; sanitary plumbing, we have been informed, was nil. While we sympathize with the spirit of the Board, we cannot say that the move was at all a practical one.

The following schedule to U. S. manufacturers of plumbing goods will, no doubt, be interesting to a great many of our readers:

CONSERVATION DIVISION
WAR INDUSTRIES BOARD
WASHINGTON, D.C.

Schedule for Manufacturers of Tubular Plumbing Goods, Covering Traps, Wastes and Overflows, Basin, Tank and Bath Supplies, Made of Brass Material, and Their Accessories.

1. No new styles, sizes or gauges to be made during the period of the war by any manufacturer.

2. **Wrought Traps** to be limited to the following styles, sizes and gauges:

One Style Plain P Trap with cleanout in 1¼ inch size.

One Style Plain S Trap with cleanout in 1¼ inch size.

One Style Sink Trap in 1¼ inch, 1½ inch, and 2 inch sizes.

All the above traps may be furnished with wrought or cast P. O. Plugs or wrought sink couplings.

All the above traps to be furnished in 20-gauge brazed tubing only.

All the above traps to be made with washer joints only.

3. **Cast Traps** to be limited to the following styles, sizes and gauges:

One Style Plain P Trap with cleanout in 1¼ inch size.

One Style Plain S Trap with cleanout in 1¼ inch and 1½ inch sizes.

One Style New York Regulation Trap with cleanout in 1¼ inch, 1½ inch and 2 inch sizes.

One Style Bag Offset Trap with cleanout in 1¼ inch and 1½ inch size.

One Style Bag Offset Trap with I P outlet with cleanout in 1¼ inch and 1½ inch size.

All the above traps may be furnished with wrought or cast P. O Plugs or wrought sink couplings.

All the above traps to be furnished in 22 B & S gauge brazed tubing only.

All the above traps to be made with washer joints only.

4. **Connected wastes** and overflows to be limited to the following styles, sizes and gauges:

One Style adjustable all wrought fixture, including wrought top and bottom strainers and wrought nuts made 1⅜ inch O. D. brazed tubing 22 B. & S. gauge.

One Style adjustable all cast fixture, including cast top and bottom strainers and cast nuts made 1⅜ inch O. D. brazed tubing 22 B & S gauge.

All Styles and sizes of Ideal or Bi-Transit wastes and overflows to be discontinued.

5. **Basin Supply Pipes** to be limited to the following styles, sizes and gauges:

⅜" **I.P.S. straight basin** supply pipes to the floor, 12 gauge brazed tubing, 26½" long, threaded on each end.

9/16 O.D. straight basin supply pipes to the floor, reduced on one end to 7/16 O.D., not threaded on either end, complete with coupling nuts, friction rings and rubber washers, 16 gauge brazed tubing.

⅜" **I.P.S. angle basin** supply pipes to the wall. 12 gauge brazed tubing, threaded on both ends.

9/16" O.D. angle basin supply pipes to wall, reduced on basin end to 7/16" O.D., not threaded on either end, complete with coupling nuts, friction rings and rubber washers, 16 gauge brazed tubing. Straight Crawford connection. Angle Crawford connection.

All the above ⅜" I.P.S. supply pipes to be furnished with reducer. All the above supply pipes to be furnished with heavy flanges.

6. **Bath Supply** Pipes to be limited to the following styles, sizes and gauges:

½" **I.P.S. straight** bath supply pipes to the floor, threaded on each end, 20½" long, 12 gauge, brazed tubing.

9/16" O.D. offset bath supply pipes, 16 gauge brazed tubing, complete with coupling nuts, slip nuts, friction rings and rubber washers.

All the above ½" supply pipes may be furnished with ball offset couplings.

All the above supply pipes to be furnished with heavy flanges.

7. **Supply Pipe for Closet Tanks** to be limited to the following styles, sizes and gauges:

One style tank supply pipe made of ⅜" I.P.S. brazed tubing, 12 B. & S. gauge, 21" long, threaded on one end, collar formed on other end, furnished with heavy flange.

Now, if no other material of such styles and gauges were allowed to be made, it will be plainly seen that any plumbing installation in which such goods are used cannot possibly be in keeping with good practice, and if the reader could have been present at the annual convention of the American Society of Sanitary Engineers, he would have realized just how those members present felt in regard to such drastic rules laid down by the War Trade Board.

In this connection SANITARY ENGINEER is of the opinion that an account of some of the discussions which were held will not be out of place here.

Mr. Rainger, one of the members present, addressed the acting chairman, Mr. L. A. Cornelius, as follows:

"Mr. Chairman, I don't believe that the War Industries Board will ever issue orders directly to the municipalities on that subject. I have received no orders, or had not until I left, to do anything but that which our city ordinance has provided should be done. And until I do receive some direct orders, I expect to live up to the city ordinances."

Acting Chairman:—"I might state that the general plan of the War Industries Board was to handle all such matters through organizations, where they existed, as for instance in the case of pipe manufacturers, who have their organization. There were five representatives chosen for the brass dealers, and two other gentlemen who were supposed to represent the brass goods manufacturers.

"Now, this thing is so vast, so large, and so far-reaching that should the War Industries Board attempt to get in touch with every manufacturer individually, in order to get his views, the war would be over before the Board came to any conclusion. At any rate, that is the method they have taken to operate in groups as far as possible.

"In speaking of, for instance, the point brought up by Mr. Rainger, I quite agree with him in not believing that the U. S. Federal Government will send any mandatory rules to the various Boards of Health. As a matter of fact, the Federal rights, State rights, and Municipal rights, as we had occasion to look up two or three years ago, are a pretty delicate subject to go into and say you can do this and you can't do that, and that is one of the obstacles of a Federal code, because a Federal code, under normal conditions, at least, could not be mandatory.

"Now, it may or may not be quite clear to you as to how the War Industries Board really enforces these rules. I do not believe there is any penalty—direct penalty, at least, to any one or to any concern for a violation of these acts that we have read, except this:

"No manufacturer, of course, can produce without his raw material. All the raw materials are directly controlled by the War Industries Board. There is not a rolling mill of steel, brass or copper but what there is a Government official there who must O.K. all the products that go out of that mill.

"In practical working, therefore, it resolves itself into this: A manufacturer writes to his mill for certain tubes or sheet, etc., etc., and he must specify exactly what that material is to be used

for, whether it is for direct Government contract or not, etc.

"If it is for the making of, for instance, brass traps, and he orders 17 gauge, and this rule says 20 or 22 gauge, then he is not going to get material, and furthermore, if any manufacturer does not co-operate, he not only will not get material he asks for, which is not in keeping with their rule, but he won't get any material at all.

"Now, this rule, as I said before, is not mandatory, but it is about as mandatory in working it out, commercially speaking, as if the gun was at your head and you had the option of obeying or not. In its real action it is so, and I think it should not be. This is not criticism, it is a matter of fact. And that procedure, you can see, does not conflict with or bring into discussion the matter of codes and various municipal rules. The Industrial War Board simply control the material.

"If any city refuses to allow the use of material that is available, all right, they can get along without material—a very pleasant option—but that is the practical working out of the system."

Protests to War Board

There then followed considerable discussion on the matter, and in committee a resolution was drafted to be sent to the War Industries Board, which read as follows:—

Subject, Plumbing Goods

"Gentlemen: The resolution of the building material section, dated Sept. 27th, and the schedule for manufacturers of tubular goods, dated Oct. 1st, have both received the attention and consideration of our membership.

"We are in full accord with any and all conservation measures which are rendered essential by our war activities.

"We realize that modifications and changes will be made in your rulings from time to time, in accordance with conditions and facts as presented to you and our war necessities.

"We have labored for years, and with considerable success, for the establishment of sanitary codes embracing standards for material and practice, that make for safe and lasting protection.

"Doubtless it is superfluous to state that your recent decisions, first above referred to, do not embrace material and practice that under normal conditions would meet with our approval.

"Lowering standards, irrespective of the present excellent reason, will compel a considerable amount of executive and educational work later, when our industrial situation is normal.

"We shall earnestly endeavor to render all possible assistance in carrying out both the spirit and the letter of your instructions, and at the same time conserve as far as possible the comfort and health of the American people.

"In the after-war period we may request equal co-operation of the Government in the re-establishment of standards that make for satisfactory and permanent protection to health and life."

Readers, Please Note the Following Discussions

Acting President: "What is the action of the resolutions committee on the resolution?"

Mr. Walker: "The action of the resolutions committee was to send a protest to the surgeon general on the quality of materials that the United States Housing Commission are installing in governmental houses. We feel that those houses are to be built, and as they are a menace to the health of their occupants, it seems to us just and proper that we should protest."

Mr. Devine: "I would state that we feel that, as far as the housing proposition is concerned, we, as members of the American Society of Sanitary Engineers, should not go on record as having been willing to lower the standards, believing, as we do, that these houses later on will become part of the individual localities in which they are built The possibilities are that they will be sold to citizens and taxpayers, and we feel that we should be placed in no position whereby later on we might be blamed in any way for any menace or ill-health occasioned or created by any lower standards recommended by us."

Mr. Mullen: "I think that the resolution which Mr. Walker read would be well enough to send to Washington, and while we are in accord with conserving as much as possible, I don't think we should conserve so far as to put the life of any occupant of a house in danger.

"The country is spending millions of dollars for many things not half as essential as good plumbing, and it would be far better to put in a good class of plumbing and cut out some of the non-essential things they are using."

Mr. Tweedy: "I know something of the construction being done on the housing development. It is a crime to anyone who has served the best part of his days in the plumbing business to see the class of plumbing that is being installed to-day by our Government. The housing scheme, as financed by the Government, is simply this: The houses are being built with the idea that at the end of the war they intend to sell those houses to the people who are going to work in those plants or in the vicinity of those plants.

"There is no vent or loop vent system, and everything they put into those houses is a necessary trap. I want to refer to two jobs in particular which I know something about. There is not a house on any of those Government reservations to-day that does not pull its own seal.

"You were told on this floor yesterday by a doctor of the United States Army how careful they are in preserving the health of the soldier and sailor. Evidently they have lost sight of the man who works in the shops and factories, and who toils with the tools. His health, I suppose, is not regarded. It should be regarded. He is just as important and has just as much right to protection as anyone else.

"I know of one case where there is a laboratory of a hospital in which a fixture is installed; the length of the waste pipe from the trap is thirty-five feet, and without a vent. In that same hospital four lavatories are installed, all the trap seals are broken every time the fixtures are used, and sewer gases enter the hospital from all the fixtures.

"I firmly believe that we should go on record at this convention, complaining of the plumbing installations being endorsed and constructed by the United States Government in their housing scheme."

Mr. Rainger: "Mr. Chairman, I take it that there is not a man in this room or within sound of my voice who is not a good loyal supporter of our Government.

"All of us here have given freely of our substance. A great many of us here have given our sons in the prime of life, to the end that this war may be carried to a successful issue. I believe that if the attention of the powers that be in Washington is called to these conditions in a logical way, by a society of the standing in the country that this society has, the Government will see fit to revise the order and to eliminate most of the objectionable features.

"The houses are going to pass into private ownership after the war. Along comes the plumbing inspector, backed by the city ordinances, and says to the owner of one of these houses, who has bought this house in good faith, supposing that the Government of this big United States knew what they were doing when they installed the plumbing in that house—"This installation is defective. It is dangerous to your health and the health of your family. We must compel you to re-install this plumbing system in accordance with our ordinance."

Other Members Spoke in the Same Strain

Quite a number of other members spoke in the same strain, and one referred in particular to the plumbing work installed in one of the great naval stations situated on the Great Lakes, "Which," said he, "will convince everyone present that the work is not safe or sanitary, but just the opposite."

One thing we in Canada, at least, can boast of and that is, any camp of any size has been equipped with a very fair type of plumbing work. Camp Borden is a model fit for anyone to see.

Mr. Lee, of Pittsburgh, was very much surprised to hear of such botch work. He declared that all houses built by the Government in his city were properly equipped with plumbing in accordance with their city ordinances.

Watch Canada's Housing Schemes

Now, here we are in Canada about to launch into one of the biggest and most important domestic schemes ever attempted. Everybody is thinking in terms of dollars and cents and first cost

of building houses. They think in cash investments and not in health insurance These dollar-and-cent men think that it is more desirable to have cheap houses, or houses built at a price that will bring cash profits, rather than to have comfort, health and greater producing power for the occupants of those houses.

Only a few years ago, comparatively, builders and owners of houses held up their hands in horror at having to install water closets in a home. There are hundreds of houses, if not thousands, in Canada to-day where no wash basin or bath tubs are installed. And if the same class of speculators are allowed their own way, they would go back to those times. We sanitary engineers must be heard. We must plead our cause, as it were, by advertising in the public press. We must show the public that good health is the only investment worth while. We must take up and answer such articles as convey to the public mind that sanitary plumbing is too costly, or can be simplified to a degree that would make it dangerous to the occupants in which such plumbing is installed.

The following is an extract from a Toronto daily paper, which should have been taken up. But, no, the public are being led to believe that wonderful things are being accomplished, that traps do not need to be vented, etc., and pipes in plumbing systems are, as a general rule, too complicated.

Thousand New Homes Under Construction in Portsmouth, Says W. S. Post

William S. Post, of New York, has had more to do with the solution of the housing problems under the United States Housing Bureau than any other single individual. In an interview with the "Star," he outlined the scheme which is successfully meeting the situation in Portsmouth and Norfolk, U.S.A., where the growth in population during the past few months has been enormous.

The situation demanded one thousand new homes in Portsmouth and 560 in Norfolk, but since the signing of the armistice the Norfolk scheme has been discontinued and may be abandoned. At the time of the first draft Norfolk had a population of 86,000, but the draft was made on the basis of 105,000 and to-day the population is stated to be more than 200,000.

Outside the limits of the city of Portsmouth a model town is under construction, untrammeled by the restraint of old developments or other ordinances and will be built up and managed along thoroughly scientific lines. Lots were laid out averaging 50 feet wide by 100 feet deep and six-room frame houses built, with a minimum space between houses of 16 feet. There are a few units of five or six houses, but 80 per cent. are detached.

Following English Plan

These houses are being built with the side to the street, the roofs running with the street line. Thus there is more circulation of air and better living conditions generally. The plans followed closely resemble the best examples of town planning in England, the central portions, however, being somewhat more regular than is the case at Weldhall and Gretna, the new "war towns" in England.

It has been possible also to give better housing conditions as regards parlors and a standard plan has been devised for each of the 50 different designs. **There are but four types of bathrooms and the heating systems have been planned in such a way that they can be made up in advance and simply installed when the house is ready. Simplified plumbing systems have been installed, doing away with 50 per cent. of the piping and eliminating altogether the back air vent.**

Demand Enormous

"The Government is spending $40,000,000 on this engineering base," Mr. Post said, "and the business being done, according to latest reports, is second only to that of New York. The demand for houses is enormous and the attitude of the Government has been to go on with only that work that was absolutely demanded. All other industrial construction of houses stopped."

The new town has been named "Craddock," after the British Admiral, the first to lose his life in the war, and the streets will be named after United States navy officers. "It is to be a thoroughly navy town," Mr. Post observed. "The expected cost of each house is $3,000 and the lots will not be more than about $80 each without the cost of local improvements."

"Could this type of house be used in Canada?" he was asked.

"Undoubtedly," Mr. Post replied. "Each is equipped with a complete hot water heating system at that price."

However, such schemes should, as we stated before, be watched with no small amount of suspicion, because, if plumbing is not well installed, and if good material is not used, the condition of such plumbing and heating will be such as will keep a lot of men forever repairing, and the trade will again be looked upon as having made work for themselves. But if we, as a craft, insist that all work installed by us is first class, that none but practical men do the work, that only good material is used, and that all jobs are properly designed, then no such statements can be made and the work will be a lasting credit to all who interest themselves in good plumbing and proper heating installations.

DANGERS OF STORING COAL

Coal deteriorates to a sensible extent upon exposure to the weather, and supplies that are held in storage should therefore be covered by a shed or roof that will afford a proper protection. Coal that is closely confined is likely to grow hot, below the surface, and good ventilation of the bins is therefore desirable, so that the coal may be aerated and cooled as thoroughly as possible. The heating is doubtless due to the slow oxidation of impurities, and under some circumstances it may be rapid and intense enough to set the coal afire—a phenomenon known as "spontaneous ignition." Fires sometimes originate in this way, deep down in a coal pile, and smolder, unsuspected, for a long time. They are often very hard to extinguish. To guard against the indefinite spread of fires in the coal pile, whether they are of spontaneous origin or not, the bunkers should be divided at frequent intervals into entirely separate pockets, by substantial walls of brick or other noncombustible material, especially if coal comes from mines the output of which is known to be especially prone to self-ignition.

IMPORT AND EXPORT RESTRICTIONS WITH BRITAIN REMOVED

Important cable dispatches have been received by Mr. G. T. Milne and Mr. F. W. Field, the British Trade Commissioners at Montreal and Toronto respectively from the Imperial Department of Overseas Trade in London, pointing out that since the armistice was signed many restrictions on commerce have been withdrawn, while in the case of those which remain, licenses are being granted much more freely than previously. Particulars regarding these relaxations will be published weekly in the "Board of Trade Journal," the official organ of the Imperial Government for notices regarding trade.

Orders placed during the war period now have good prospects of being executed, and arrangements for new business should be made without delay.

The following relaxations in particular should be noted:

1.—Permits to manufacture and priority certificates in connection therewith are no longer necessary.

2.—Firms are at liberty to accept civil or commercial orders for immediate execution, thus freeing the engineering industry among others for commercial work.

3.—All the principal kinds of raw materials may now be used for the commercial manufacture of goods for export, but these raw materials themselves may not be exported in certain cases without licenses. Among those to which this condition applies are the following:—Aluminum, brass, iron, nickel, steel, antimony, copper, lead, spelter or zinc, tin.

In general, restrictions on the export of manufactured goods have been removed, while they have been retained in the case of raw materials.

The following list indicates the most important items, the export of which was formerly prohibited to all countries but are now permitted to be exported to any part of the British Empire: Articles of aluminum; articles, manufactures of asbestos, belting, cotton, including belting impregnated with balata or rubber; copper, and manufactures of, except wire bars, plates, rods, sheets, strips, tubes; galvanized sheets, corrugated or flat; grindstones; hollow ware, domestic, or iron or steel plate; iron and steel rivets, nuts and screws; iron and steel wire cloth; incandescent mantles and rings; magnesite and magnesite bricks; rubber manufactures. except surgical gloves; steel sheets (black); tools (small).

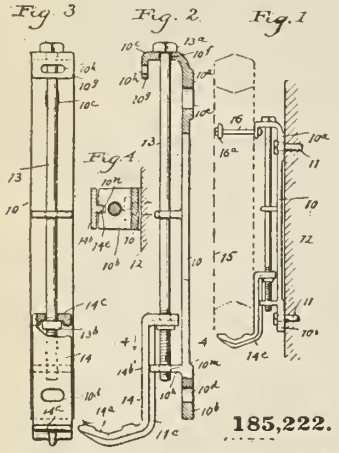
Certain factors will continue to hamper the export trade, notably: (1) shortage of labor till the army is demobilized; (2) shortage of tonnage; (3) the need for reorganization of plant in certain industries before resuming normal work, but it is considered that the effect of these factors will diminish greatly in a few months.

New Canadian Patents

No. 185,222

George I. Chittenden, Lakewood, Ohio, U.S.A., 2nd July, 1918; 6 years. Filed 27th April, 1918. Receipt No. 294,245.

Claim.—1. A hanger for a wall radiator comprising a bracket adapted to be secured to a wall and having laterally projecting portions, a bolt passing freely through the laterally extending portions of the bracket, a radiator seat having a lower radiator engaging portion and having a portion extending upwardly



Hanger for Wall Radiators.

therefrom and adjustably connected to the bolt between the laterally extending portions of the bracket.

2. A hanger for a wall radiator comprising a bracket adapted to be secured to a wall and having outstanding portions, a bolt passing freely through these portions, a lower radiator seat having a portion adapted to engage the lower part of the radiator and having an upwardly extending part with an opening through which the bolt freely passes, a nut on the bolt held from turning by the seat and supporting the seat, said nut being located between the outstanding portions of the bracket.

3. A hanger for wall radiators comprising a bracket adapted to be secured to a wall and having laterally projecting ears, a bolt passing freely through both ears, a radiator seat having a radiator engaging portion beneath the lower ear, and having a portion extending upwardly past the lower ear and adjustably supported on the bolt between the ears, the upwardly extending portion of the seat and the lower ear having interfitting guiding portions.

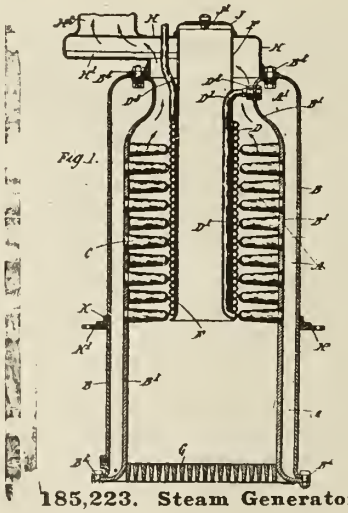
4. A hanger for a wall radiator comprising a bracket having upper and lower outwardly projecting ears, a bolt passing freely through the ears and provided with an adjustable nut between the ears, a radiator seat having a lower portion which is beneath the lower ear of the bracket, an upstanding portion which extends past the lower ear, and an inwardly extending portion through which the bolt passes, and which rests on said nut, the upwardly extending portion of the seat and the lower ear of the bracket having interfitting portions.

5. A hanger for a wall radiator comprising a bracket having outwardly extending ears, the upper ear terminating in a down turned lip, constituting a side bearing portion for the radiator, a bolt extending freely through both ears, a lower radiator seat adjustably connected to the bolt between the ears, and means passing through said lip and adapted to extend through the radiator for passing the radiator against said lip.

No. 185,223

Thomas Clarkson, Chelmsford, Essex, England, 2nd July, 1918; 6 years. Filed 30th June, 1917. Receipt No. 281,635.

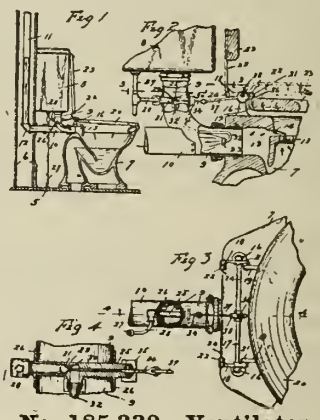
Claim.—1. In a steam generator for a motor road vehicle the combination of an annular water chamber, straight tubes radiating inwardly therefrom and having closed ends, a superheater coil adjacent to the inner ends of said tubes the space between the superheater coil and the annular water chamber forming an annular combustion chamber through which the tubes pass and a grate for solid fuel below said tubes on to which grate the fuel can pass down through a central chamber surrounded by the tubes.



185,223. Steam Generator.

2. In a steam generator for a motor road vehicle the combination of an annular water chamber, straight tubes radiating inwardly therefrom and having closed ends, a superheater coil adjacent to the inner ends of said tubes the space between the superheater coil and the annular water chamber forming an annular combustion chamber through which the tubes pass, a grate for solid fuel below said tubes and a shield within the superheater coil forming a passage or conduit down which solid fuel can be fed on to the grate.

3. In a steam generator for a motor road vehicle, an annular water chamber formed between two substantially cylindrical walls connected by flanged joints at the top and bottom, straight tubes radiating inwardly from the inner wall of said tubes having their open ends communicating with the annular water



No. 185,339. Ventilator.

chamber and their inner ends closed, a superheater coil adjacent to the inner ends of said tubes, the space between the superheater coil and the annular water chamber forming an annular combustion chamber through which the tubes pass, a grate for solid fuel below said tubes, a shield within the superheater coil forming a passage or conduit down which the solid fuel can be fed on to the grate, a cover closing the space at the top of the cylindrical walls, such cover having an opening through which the top of the central shield passes, and a removable cover for the upper end of said shield.

No. 185,339

William M. Anderson, and Nels Bruce, assignee of a half interest, both of Minneapolis, Minnesota, U.S.A., 2nd July, 1918; 6 years. Filed 19th February, 1918. Receipt No. 291,167.

Claim.—1. The combination with a closet bowl, a water supply, a ventilating stack and a single connection between the closet bowl, water supply and ventilating stack, of a spraying nozzle connected to the water supply located in said connection and arranged to direct a spray of water toward the ventilating stack.

2. The combination with a closet bowl, a water supply, a ventilating stack and a single connection between the closet bowl, water supply and ventilating stack of a water pipe leading from the water supply and having a spraying nozzle lo-

cated in said connection and arranged to direct a spray of water toward the ventilating stack, a valve interposed in the water pipe and incorporated in said connection, and means for opening and closing the valve.

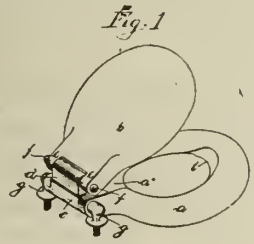
3. The combination with a closet bowl, a water tank, a water supply pipe leading to the water tank, a ventilating stack and a flushing bend connecting the water tank and closet bowl, said bend having an extension connecting the delivery end thereof with the ventilating stack, of a valve casing interposed in the flushing bend at its receiving end and connected to the water supply pipe, a normally closed valve in said casing, a water tube leading from the valve casing and having a spraying nozzle located in the delivery end of the flushing bend, and means for opening said valve.

No. 185,224.

George W. Collins, Holyoke, Massachusetts, U.S.A., 2nd July, 1918; 6 years. Filed 11th November, 1916. Receipt No. 271,883.

Claim.—1. The combination of a seat having a rearward extension, means for hingedly mounting said seat in place, an upward projection upon said seat, and a cover hingedly mounted upon said projection independently of the hinging elements of the seat and detachable therefrom at pleasure without impairing the sightliness of the seat or dismounting or exposing wholly or in part the seat hinging elements.

2. The combination of a seat having a rearward extension, means for hingedly mounting said seat in place, an upward projection fixedly applied to said rearward extension, a cover having rearward extensions adapted to engage said seat projection, and means independent of the seat hinging elements for hingedly connecting the seat projection and the cover extensions, whereby the cover may be detached and removed without affecting the seat hinging elements or impairing the sightliness of the seat.



No. 185,224. Closet Seat and Cover.

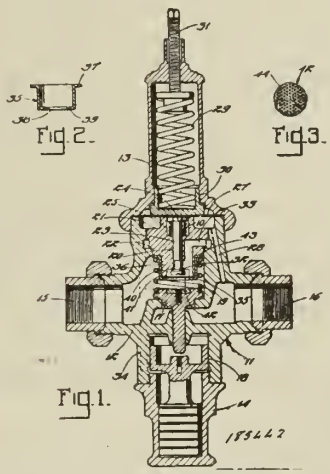
3. The combination of a seat having a rearward extension, hinge posts having pintles engaging said extension, a projection rising from said extension, a cover having rearward extensions aligned with the seat projection and provided with pintle openings, and pintles passed through the cover extensions and into the seat projection.

4. The combination of a seat (a) having a rearward extension (e), posts (g) adapted to be secured to the bowl and having lateral projections (j) entering openings in the part (e) adapted to receive them, a part (d) mounted upon and permanently secured to said rearward extension (e), a cover (b) having rearward extensions (c) and pivotal connections between the part (d) and the arms (c) all arranged and operating, substantially as shown.

No. 185,442

The Mason Regulator Company, Boston, assignee of George Sampson Melcher, Sharon, both in Massachusetts, U.S.A., 9th July, 1918; 6 years. Filed 3rd May, 1918. Receipt No. 294,471.

Claim.—1. A pressure regulator comprising a valve body having an inlet and an outlet opening, a partition between



185,442. Pressure Regulator.

said openings having a hole therethrough, a main valve controlling the passage of fluid through said partition, a piston for opening the main valve, and a spring for operating it in the other direction which tends to close the main valve, said body having a communication port between said inlet opening and said piston, an auxiliary valve controlling the passage of fluid through said communication port, means for operating said auxiliary valve, and a housing about said auxiliary valve having a strainer therein, said main valve spring being interposed between said main valve and said housing whereby said housing is secured in position.

2. A pressure regulator comprising a valve body, a main valve controlling the passage of fluid through said body, a plug at one side of said main valve, a piston by which said main valve is operated in one direction, a communication port through said plug and valve body whereby the fluid passage through said valve body is connected to the piston, an auxiliary valve located in said plug which controls said port, means for operating said auxiliary valve, a housing which encloses said auxiliary valve and surrounds a portion of said plug and has a hole therein, a strainer disc over said hole, and a main valve spring by which said housing and said strainer disc are held in position.

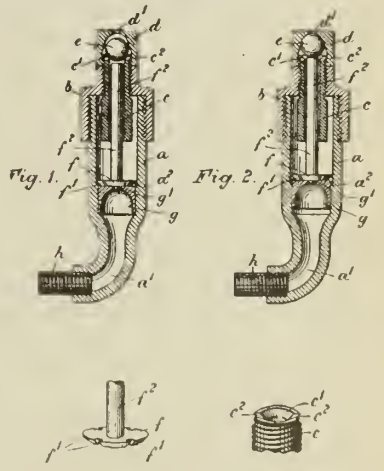
3. In a regulator of the class described, the combination with a main valve, opened by a piston, of a plug located above the main valve, an auxiliary valve located in said plug and controlling the flow of fluid to said piston, a housing surrounding a portion of said plug and having a flange thereon which rests against the same, a strainer disc in said housing, and a spring surrounding said housing and bearing at one end against said flange and at the other end against said main valve and thereby operating to tend to close said main valve and to hold said housing in position.

4. In a regulator of the character described, the combination of a main valve which is opened by a piston, of an auxiliary valve which controls the flow of steam to said main valve piston, a diaphragm which controls said auxiliary valve, a plug in which said auxiliary valve is located having a recess therein with a flange surrounding the recess, a strainer housing which surrounds said flange, an annular flange on said housing, a strainer disc between said housing flange and said plug flange, and a main valve spring interposed between said housing and said main valve which operates to tend to close said main valve and to hold housing and strainer disc in position.

No. 185,361

John Callicott, Toronto, Ontario, Canada, 9th July, 1918; 6 years. Filed 28th November, 1917. Receipt No. 288,115.

Claim.—1. A device of the class described comprising a ball casing having an outlet orifice therein, a ball within said casing, a plunger casing communicating with said ball casing and having an inlet orifice therein, and a plunger slidably accommodated within said plunger casing, said plunger being adapted, when raised, to move said ball to close said outlet orifice, and said ball



185,361. Check Valve.

being capable of retention in such closing position at a lower pressure than that required to raise said plunger.

2. A device of the class described comprising a ball casing having an outlet orifice therein, a ball within said casing, a plunger casing communicating with said ball casing and having an inlet orifice therein, a plunger slidably

(Continued on page 48)

Create New Business This Way

Cultivate New Acquaintances, be a "Mixer"—Let These New Friends See That You Are Interested in Their Welfare—Making the Store Window Work—Planning For 1919 Business

SINCE the eleventh of November last, and after the excitement accompanying so joyous and so unexpected a termination to the Great War had died away, I have been thinking of reconstruction. Not that I expect to be bidding upon contracts for heating or plumbing in a large way for some little time, for, of necessity, there will be a period of readjustment. Conditions that required the harnessing of every resource and every effort in a great scheme to stem the tide of a powerful and insistent enemy, cannot be changed over in a day. And so great and unexpected was the surprise to the whole world, brought about through the agreement upon an armistice, that we have had to stop and pause. As if waking from a prolonged nightmare, one has had to get his bearings and just decide where he is at.

I believe that there is a great opportunity ahead for the sanitary and heating engineer. Had I not thought so, the anxious times of the past four years would long since have decided me upon a different vocation and my shop would have been closed and what equipment and stock I possessed would have been sold to the highest bidder.

In deciding to stay with my ship of business I figured that the growth of my city, though still a small one, would justify my holding on. I have done so. It is a poor business that will not bring its owner a decent living. By keeping on the job faithfully over the period of the war I am glad to say that I have been able to keep things going and to make a fair living for my wife and family. From now on I propose to make more than a mere living. Opposition or no opposition, I am going after all there is for me in the days to come.

The winter season is not a good time in which to look for big business in so extreme a climate as Canada—not from the standpoint of the sanitary and heating engineer. But it is a good time to make plans. And this is what I mean to do this winter.

In the first place I am going to make up a list of prospective customers. In securing names that will be live and worth spending stationery and postage on I mean to do personal canvassing as much as circumstances will permit. This is my one big card. I know that it has been hard for me to call on men in the past and ask for a share of their work, but I can say this, that the more I cultivate the acquaintance of the citizens within my own city, the more friendly a great many of them are toward me. Not only so, but I have been taken into the confidence of these men frequently and have attained a position

Editor's Note—The writer has consented to outline his views to SANITARY ENGINEER readers as to what he proposes doing under the conditions which he expects will prevail soon, now that peace is assured. Others will at least be interested in this plumber's plans and may wish to adopt some of the ideas which he has planned for his own business.

of respect which I scarcely think would have been possible had I not made myself somewhat of a mixer. I say "made," advisedly and meaningly. For I, like many of my fellow craftsmen whom I know, was inclined to be retiring. It got me nowhere. In talking with friends from time to time I found that they made friends because they called on people and interested them in some way. I endeavored to be so myself, and in looking back over several years believe that I have made scores of good friends who would never have known me, nor I them, had not I got out of my rut and deliberately "cultivated" new acquaintances.

After making up my list of prospects I shall write them a good letter and say that I will be ready to furnish estimates for them on any work which they may have. I will further call upon them in quest of contracts. Many of them will contemplate either new buildings or the renovation of old ones. I shall show them that I am interested in this development and to prove my sincerity I propose to make a bid for their confidence by spending the time necessary to give them suggestions as to how their ideas may be most economically and profitably carried out. If possible, I will suggest alternate schemes. If it be a hot water job or steam, I shall prepare rough, but neat sketches of the system and give logical reasons why the plant ought to be laid out after my ideas. In making these suggestions I shall, of course, depend much upon the interest I have awakened in my prospect as to my sincerity in his behalf. But, notwithstanding this, I shall make it clear that he is at liberty to seek other plans and suggestions. This, I feel, will do me no harm, for it will indicate that I am willing that my prospect should see what others have to offer. I will, at the same time, be careful to keep in close touch with him and will also ask him to carefully investigate the suggestions of my competitors.

As heretofore, I shall also keep in touch with reliable contractors. I have always done my work well, and while some contractors have been very unreliable, I think that I know several of the honest ones on whom I can depend to be fair with me. If I can cultivate them, as I mean to do, they will surely give me an opportunity as readily as the other fellow. And just here I mean to make it my business to interview the owner and tell him honestly what he has a right to expect in his sanitary and heating requirements.

Of advertising I mean to do a considerable amount. This will be conducted wisely and as well as I know how. It will appear regularly in the local paper and each announcement will be a different one. I mean to use illustrations, and there are many of these that make up very nicely when the reading matter that accompanies them is simple and to the point.

I have a window to my shop. It is pretty dirty just now and not very well suited to the purposes of display. Last summer I let it accumulate a lot of dust and the fittings in it were not very attractive at the end of the month. I expect to spend about $100 on this in overhauling it and will drop the floor of it so that the people in passing can look into it without trouble. I will arrange to have a permanent backing in this window and most of the time I mean to show a model bathroom. This will have tiled wall paper at the back and no more fixtures than one would see in a well-appointed bathroom. There will be a towel rack at one end and a clean towel on this. I shall cover the floor window with a piece of good linoleum and place a bath mat in front of the bath. After all this is arranged I will have a neat sign ready, and this will read: "This is the model bathroom you have wanted. Let us estimate its cost for you."

Inside my shop I will make a neat display of tubs and closets, basins and slop sinks, and of other fittings. I shall also have an arrangement of furnaces, covered and uncovered, both hot water and steam. These will be painted up to show well when the customer is looking them over.

Altogether, I look for a gradual improvement in conditions and I purpose being ready for it. I intend to read my trade paper carefully, for I do not know it all and like to read what problems the other craftsmen have had. I am always glad to learn anything useful, and there are many patterns and ideas published which I am glad to study. I am out for a banner year in 1919.

Studying Big Problem.—A series of weekly lectures on "Industry, and the Problems of Reconstruction" are being given at the McGill University by Francis Hankin, who has made a special study of the relations of labor and capital from a business standpoint.

PRACTICAL SHEET-METAL WORK

THREE PIECE ELBOW WITH GUSSET OR GORE PIECE.

BY THOMAS STANSFIELD

IN this issue is shown a flared article, round at top, square at bottom, but with the base at an angle to the top, as shown in side elevation.

Draw plan as shown by A B C D, placing plan of top in centre, as shown by circle. Divide the plan of top into four sections, having the diameter drawn from the division parallel to the sides of base as described at 1 9 to A B. From each of these points draw lines to corner (see A B C D). From each of the divisions in the circle draw lines to the nearest corner, as between 1 5 to A and 5 9 to C, repeating same on the other two sections. The lines thus obtained form the bases of angles; the height of the angles at A and D is the straight height on elevation. From A to D, as shown by line E A, with E D as an altitude, and the different points A 1 to A 5 as bases form the angles shown at X A 1, thus obtaining the points X 1, X 2, etc., to X 5. The height of angles at B and C is equal to straight height between B C on elevation, as shown by B F, with B F as altitude and the points B 5 to B 9 as bases, form the angles shown at X B 5.

To lay out pattern, draw a line equal to D A on elevation, as shown by E 1. With E as a centre and E A of plan as a radius, then draw an arc. And with X 1 at angle A as radius and point 1 of pattern as a centre draw an arc intersecting the one drawn from E, thus obtaining point A.

With point A as a centre and the different points X 2, X 3, X 4, and X 5 at angles A as radii draws arcs intersecting each, as drawn with arc drawn from last point obtained, as from point 1, to obtain point 2, 2 to 3, etc., the radius of the arc being one division of circle in plan. When point 5 is obtained, draw lines joining A 5, with A as a centre and A B on elevation. As a radius, note that A B on elevation shows correct length A B, but on plan it does not; draw an arc. With X 5 at angles at B as a radius and point 5 as a centre draw an arc intersecting the one drawn from A obtaining point B.

Now draw lines, joining A B and B 5 With B as a centre and the different points, X 5, X 7, X 8, X 9, as radii, draw arcs intersecting each as drawn, with arc drawn from last obtained point, the radius being equal to one division of circle in plan. When point 9 is obtained, draw a line joining B 9 with B as a centre, and B C on plan as a radius draw an arc. With X 9 at B as a radius and point 9 on pattern as a centre, draw an arc intersecting the one drawn from B, thus obtaining point C.

Next draw lines joining B C and C 9, with C on pattern as a centre and the different points, X 9, X 8, X 7, X 6, and X 5, as radii. Then draw arcs intersecting each as drawn, with arc drawn from last obtained point, this arc having a radius equal to one division in circle on plan. When point 5 is obtained, draw a

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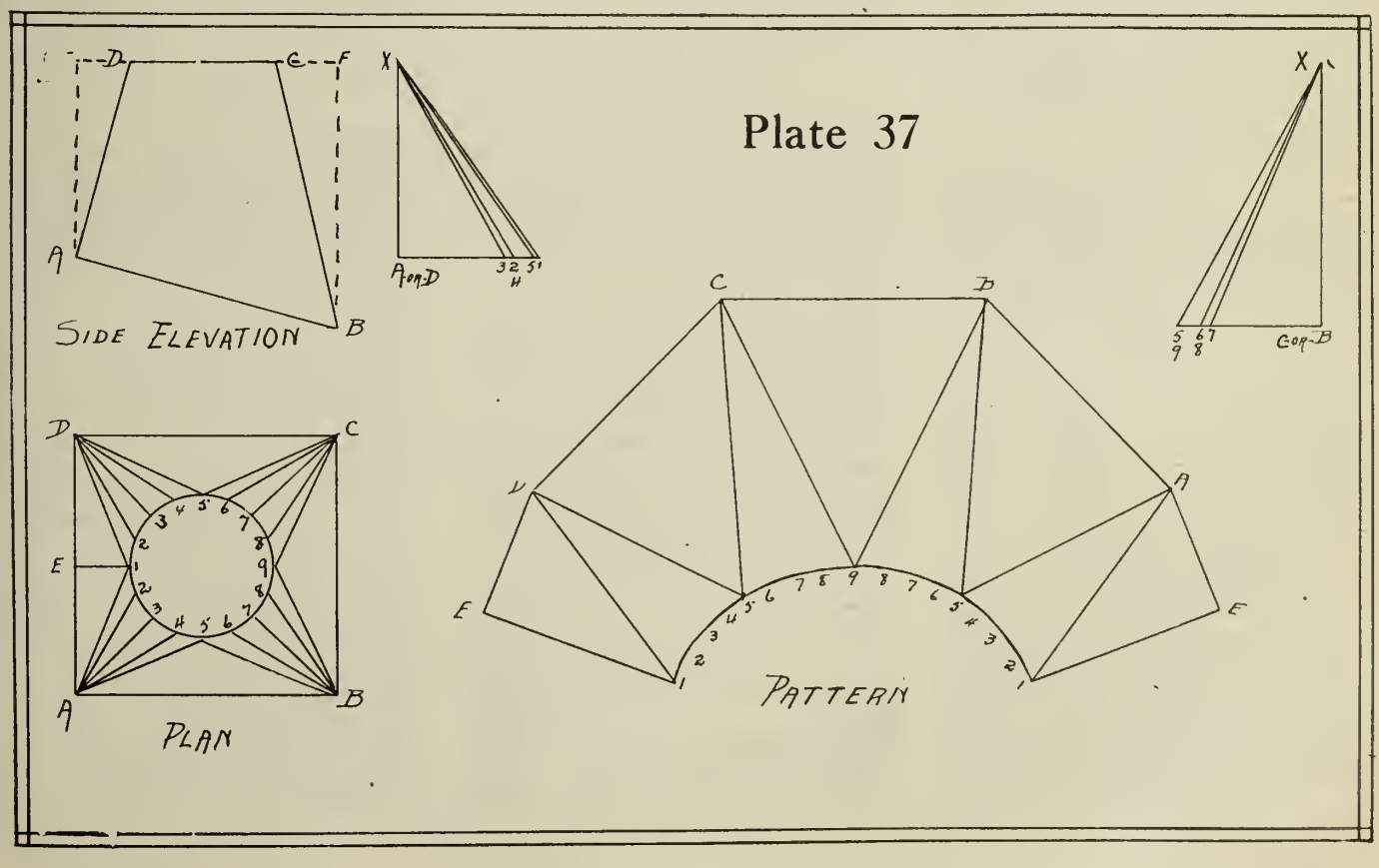


Market Conditions and Tendencies

Statements Regarding Supplies and Trend of Prices

THE MARKETS AT A GLANCE

WROUGHT pipe has undergone a revision in price, the new quotations providing for a decline. This is in line with declines registered in basic materials and a gradual lessening of production costs through more efficient labor. Wrought steel shows the greater change in both buttweld and lapweld, the standard buttweld in genuine wrought iron, with the exception of two or three sizes, remaining unchanged. XX strong buttweld and XX strong lapweld remain at former price levels.

Boiler tubes, on which lower prices were expected, have not yet been revised. Jobbers are working on stocks which were bought at high levels, and it may be a little while yet before new prices are named. Supplies are now considered very good. A slight change in malleable and cast iron pipe fittings is recorded in some quarters.

The steady decline in pig lead has resulted in a further lowering of prices on lead pipe and lead waste. The present basis of quoting provides for declines of 1c per pound. A lower basis on tin, when combined with a similar situation on lead, might be expected to work out in lower solder, and this has been the case. Quotations to-day are below those prevailing a couple of weeks ago.

Ingot metals have shown comparatively little change the past couple of weeks. There is so little doing just now and there seems to be no way to determine exact values, so that one can hardly say what the market is. In fact, some authorities state there is no market, and until conditions readjust themselves to marked activity in peace-time pursuits, values will be difficult to name.

TORONTO, Jan. 13—Lower prices have been named on wrought pipe and a slight revision is noted also in some quarters of malleable and cast fittings. Lead pipe and waste are down another cent per pound, while other lines show little variation. The situation in regard to sheets and plates shows improvement, supplies coming through well. Business is seasonably quiet.

Range Boilers Holding Steady

RANGE BOILERS—There is a steady tone noticeable in the market on range boilers. There is only a fair amount of business offering just now, but this is carrying an unchanged basis of quotations which is as follows:

	Standard	Extra Heavy
30-gallon range boilers	$14.00	$17.00
35-gallon	17.00	20.50
40-gallon	20.50	24.00
52-gallon	28.00	32.00
66-gallon	37.00	42.00
82-gallon	45.00	50.00
100-gallon	62.00	70.00

Unchanged Position Holds in Enamelware

ENAMELWARE—No new developments are recorded relative to enamelware. The market is quiet and holding steadily with prospects considered very bright for business during the year. This will not show immediately, but it won't be long before spring comes and with it an increased volume of orders.

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Basins, flat back, 14 x 15 in.	6 00
Do., corner, 15 in.	5 95
Sinks, roll rim, 18 x 30 in., staple	16 80
Closets, oak tank and seat	27 00
Do., enamel iron or white vitro tank	29 00

Soil Pipe Stocks Low; Fittings Down

SOIL PIPE, FITTINGS—The market on soil pipe shows little variation. Stocks generally are low, but a gradually improving situation in regard to securing raw material and labor will, it is thought, overcome this to a great extent by the time business is again coming along actively.

New prices established in some quarters on fittings show a slight reduction, present quotations ranging as follows: Malleable and cast bushings, 18 to 20 per cent.; unions, 35 per cent., plugs, 15 per cent.; Class B malleable fittings, black, 26 to 27c per pound; Class C, black, 18c to 19c; Class B, galvanized, 37c; Class C, galvanized, 26c to 27c.

SOIL PIPE AND FITTINGS

Medium and extra heavy soil pipe, 2 in. to 6 in.	15%
Medium and extra heavy fittings, 2 in. to 6 in.	25%
8 in. soil pipe and fittings	Net list

C. I. PIPE FITTINGS

Cast iron fittings	Net List
Plugs	15%
Bushings	18 to 20%
Unions, standard	35%
Dart unions, ¼-inch to 2-inch	15%
Do., 2½ in. and larger	6½%
Nipples, up to 4-inch	45%
Do., 4½-inch and larger	40%
Do., running thread 4-in. and under	25%
Couplings, 4-in. and under	35%
Do., 4½ in. and larger	15%

MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittgs., Class A, lb.	.60	.75
Do., Class B, lb. net	.26 to .27	.37
Do., Class C, lb. net	.18 to .19	.26 to .27

Situation in Valves Unchanged

VALVES—There have been no new features of great interest develop in respect to valves during the past couple of weeks. Business is seasonably good and prices are holding without change.

	Discount off list
Ground work	40
Compression work, standard	45
High grade	41
Cushion work	40
Fuller work, standard	43
High grade	36
Basin cocks, No. 0 standard	38
Nos. 1 and 2	38
Bath cocks	48
Flatway stop and waste cock, standard	45
High Grade	45
Roundway stop and waste cocks, standard	45
High Grade	45
Brass steam cocks, standard, add 10%.	
Globe, angle and check valves, standard.	Net
Do., removable seat	Add 5%
Radiator valves, standard	10
Do., removable seat	Net List
Patent quick opening valves	30
Basin Cocks— No. 0 and 1, Fuller pattern	43
Globe, angle and check valves, standard, medium pressure	10
Radiator valves, standard med. pressure.	30
Radiator valves, removable seat, medium pressure	25

Waste Unchanged; Oakum Steady

WASTE, OAKUM—Waste is without change. The volume of business is good and outlook for the year very satisfactory. No change in price is recorded as yet and any revisions to come are expected to be gradual. Oakum is steady at unchanged figures with a fair amount of business coming to hand.

	Per 100 lbs.
Best America n	$21 00-$22 00
Clipper, spun	- 21 00
Do., unspun	- 10 50
Plumbers', spun	10 00- 10 50

Lower Prices on Wrought Pipe

WROUGHT PIPE—A lower basis of quotations has been worked out on wrought pipe according to advices now available. The new price list has been worked out along basis made in basic materials in the United States markets, it is said, along with a gradual lessening of production costs due to more efficient labor. Prices on the XX Strong Buttweld and XX Strong Lapweld pipe remain at unchanged figures. Genuine wrought iron standard buttweld only shows a revision in two or three sizes. The new prices appear in panel herewith:

WROUGHT PIPE
Price List No. 38—January 6, 1919.
Standard Buttweld

	Steel		Gen. Wrot. Iron	
	Per 100 feet			
	Blk.	Gal.	Blk.	Gal.
⅛ in.	$6 00	$ 8 00	$	$ ....
¼ in.	4 68	6 81	5 28	7 41
⅜ in.	4 68	6 81	5 28	7 41
½ in.	6 21	7 78	7 06	8 63
¾ in.	7 82	9 95	8 97	11 10
1 in.	11 56	14 71	13 26	16 41
1¼ in.	15 64	19 90	17 94	22 20
1½ in.	18 70	23 76	21 45	26 54
2 in.	25 16	32 01	28 86	35 20
2½ in.	40 37	51 19	.....	.....
3 in.	52 79	66 94	.....	.....
3½ in.	67 16	84 18	.....	.....
4 in.	79 57	99 74	.....	.....

Standard Lapweld

	Steel		Gen. Wrot. Iron	
	Blk.	Gal.	Blk.	Gal.
	Per 100 feet			
2 in.	$28 86	$35 34	$32 56	$39 03
2½ in.	42 12	52 36	47 97	58 21
3 in.	55 08	68 47	62 73	76 12
3½ in.	69 00	86 94	78 20	96 14
4 in.	81 75	103 00	92 65	113 90
4½ in.	93 00	118 00	112 00	137 00
5 in.	108 00	137 00	130 00	159 00
6 in.	140 00	178 00	169 00	206 00
7 in.	183 00	232 00	219 00	268 00
8L in.	193 00	244 00	230 00	281 00
8 in.	222 00	281 00	265 00	324 00
9 in.	266 00	336 00	.....	.....
10L in.	246 00	312 00	294 00	360 00
10 in.	317 00	402 00	379 00	464 00

Terms, 2% 30 days, approved credit.
Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Decline Boiler Tubes Not Here Yet

BOILER TUBES—It was indicated in last issue that lower prices were under contemplation on boiler tubes, but these are not yet effective. Supplies coming to hand have been bought on a high basis, and it may be a little while yet before a lower selling level will be attained. Stocks are now in very good shape, recent shipments improving the situation materially. Quotations range as follows:

BOILER TUBES—	Cold Drawn	Lapweld
1 inch	$36 00	$.....
1¼ inch	40 00	.....
1½ inch	43 00	36 00
1¾ inch	43 00	36 00
2 inch	50 00	36 00
2¼ inch	53 00	38 50
2½ inch	55 00	42 00
3 inch	64 00	50 00
3¼ inch	.....	58 00
3½ inch	77 00	60 00
4 inch	90 00	76 00

Tonnage Sheets Coming Considered Good

SHEETS, PLATES—The tonnage already coming to hand on galvanized and black sheets is considered good and manufacturers and jobbers are quite satisfied that supplies will come along very well from now forward. Prices have ruled at unchanged levels and are quite firm at present basis, which is reproduced below. Orders coming to hand are only fair, but greater activity is looked for in the next few weeks.

BLACK SHEETS—	Per 100 lbs.
10 gauge	$....-$7 50-$8 50
12 gauge	6 85- 7 35- 8 35
12 gauge	6 90- 7 20- 7 90
16 gauge	7 00- 7 25- 8 00
18-20 gauge	....- 7 30- 7 80
22-24 gauge	....- 7 35- 7 85
26 gauge	....- 7 40- 7 90
28 gauge	....- 7 50- 8 00
3-16 inch plate	....- ....- 7 40
¼ inch boiler plate	....- ....- 7 00

Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

GALVANIZED SHEETS—		
10¾ oz.	$9 30	$9 75
U.S. 28	9 00	9 25
U.S. 26	8 70	8 95
22 and 24	8 55	8 80
16	8 25	8 50
12 and 14	8 15	8 40

Second row of figures subject to rebate of 25c per 100 lbs. in some quarters for orders amounting to one-half ton or more.

Lead Pipe and Waste Comes Down 1c

LEAD AND ZINC PRODUCTS—In line with conditions outlined in SANITARY ENGINEER last issue, lower prices have been named on lead pipe and lead waste. The decline amounts to 1c per pound, to-day's figures being 13c and 14c per pound respectively. Lead sheets are somewhat easier in some quarters, too, selling down to 11½c-12½c per pound. No change in lead traps and bends has been made.

Solders show a further slight revision to lower levels in some quarters, lower tin and lower lead being contributing factors. The demand is fair and supplies ample to take care of requirements Quotations follow:

Lead pipe, lb.	....	$0 13
Lead waste pipe, lb.	....	0 14
Lead traps and bends	....	Net list
Lead wool, lb.	..	0 14
Lead sheets, 4 to 6 lbs., sq. ft., in rolls, lb.	0 11½	0 12½
Solder, commercial, lb.	0 33	0 39
Cut sheets ½ to ¾c lb. extra and cut sheets to size, 1c lb. extra.		
Solder, guaranteed, lb.	$0 40	$0 45
Solder, strictly, lb.	0 38	0 43
Solder, commercial, lb.	0 33	0 39
Solder, wiping, lb.	0 31½	0 45
Solder, wire, lb.	0 47¼	0 54
Zinc sheets, per lb.	....	0 26

Old Materials May be Revised

OLD MATERIALS—Some changes seem to be under discussion in regard to old materials and an early announcement as to what these may be can be expected. Trade just now is quiet and quotations shown herewith are really only nominal.

Dealers' Buying Prices

Tea lead	$0 05¼	$....
Heavy lead pipe	....	0 08
Yellow brass	0 12	0 13
Red brass	....	0 21
Light brass	....	0 09½
Heavy zinc	0 05½	0 06
Heavy copper	0 22	0 23
Stove plate, per ton	....	25 00

Metals Show Little Change; Tin Down

INGOT METALS — There is very little interest manifest in the various metals and little trading is in progress. It is hard to say what the market is or whether there really is a market just now. It will probably take some little time for what may be called a real market to develop. Tin has declined another 5c in some quarters.

COPPER—No new developments have been reported locally. The metal is quiet and interest lacking. Quotations hold unchanged at around 30c per pound.

TIN—Advices indicate that the London market is up £14 this week, but whether this will have any effect on prices here is doubtful. A slightly lower basis has been reached here, quotations ranging from 70c to 80c per pound.

SPELTER—Perhaps the most active metal is spelter, but even this could be better. Supplies are only fair, but equal to demands. The price holds around 9½c per pound.

LEAD—Lots of it and no place to sell it. That is really the situation on lead and until things open up in the spring little activity is expected. Prices are down around 8¼c to 8½c per pound.

ALUMINUM — There have been no new items of interest develop since last issue, the market being dull and prices holding at nominal figure of 50c per pound.

ANTIMONY—Even at 10c per pound, the local price, there is no activity in this metal and little interest seems to attach to it. Users are few and demand consequently limited.

WHAT THE WORLD WAR HAS DONE TO PRICES

Interesting Figures of Peace Prices Before and After the Big War—Some Lines Record Declines Since Signing of Armistice

The Goods.	The Prices. Aug. 1, 1914.	Aug. 1 1918.	Jan. 15, 1919.
Boilers, Range, Standard			
30 gallon	$5.00	$14.00	$14.00
Boiler Tubes			
Lapweld, 1½-in.	$9.75	$36.00	$36.00
Lapweld, 2 -in.	8 25	36.00	36.00
Lapweld, 2¼-in.	10.25	38.50	38.50
Lapweld, 2½-in.	10.65	42.00	42.00
Lapweld, 3 -in.	11.00	50.00	50.00
Cement			
Per barrel	1.85	3.25	3.50
Chain, Electric Weld			
BB, per 100 lbs., 3-16 in.	9.25	18.25	18.25
¼ in.	6.50	15.65	15.65
5-16 in.	4.90	13.15	13.15
⅜ in.	4.25	11.90	11.90
Copper Sheets	14.25	41.00	42.00
Cord, Sash, Nos. 8, 9,9 10, per lb.	.29	.70	.75
Canada Plate			
Ordinary 52 sheet, per box	2.85	8.50	8.00
Terne Plates			
I C, 20 x 28, 112 sheets	7.40	.....	25.00
Iron and Steel Bars			
Common Bar Iron, per 100 lbs.	2.00	5.25	4.75
Refined Iron, per 100 lbs.	2.40	5.65	5.15
Mild Steel, per 100 lbs.	2.00	5.50	5.00
Sleigh Shoe Steel, per 100 lbs.	2.25	5.50	5.00
Tire Steel, per 100 lbs.	2.20	5.70	5.20
Tool Steel, per lb.	8½-.13½	.20-.42	.22-.30
Lead			
Pipe	0.07	0.15	0.13
Waste	0.08½	0.16	0.14
Wool	0.08	0.15½	0.14
Traps and Bends	40%	Net List	
Nails			
Wire, per 100 lbs., base	2.25	5.30	5.50
Cut, per 100 lbs., base	2.70	5.65	5.85
Oakum			
Best (American), bale	8.00	21.00	21.00
Oil, Coal, per gallon	15½-.18.	18½-.21½.	18½-.21½
Waste, Cotton			
White, per lb.	.08¾-.13	.17¼-.21.	
Colored, per lb.	.05-.07¾.	10½-.16½	

The Goods.	The Prices. Aug. 1, 1914.	Aug. 1, 1918.	Jan. 15, 1919.
Wrought Pipe, Buttweld, 100 ft.			
¼ and ⅜ in., black	2.10	5.22	4.68
½ in., black	2.55	6.63	6.21
¾ in., black	2.93	8.40	7.82
1 in., black	4.33	12.41	11.56
1½ in., black	7.01	20.08	18.70
2 in., black	9.43	27.01	25.16
¼ and ⅜ in., galvanized	3.00	7.35	6.81
½ in., galvanized	3.48	8.20	7.78
¾ in. galvanized	4.08	10.52	9.95
1 in., galvanized	6.03	15.56	14.71
1½ in., galvanized	9.76	25.16	23.76
2 in., galvanized	13.13	33.86	32.01
Rivets, Iron			
Blacked and tinned, discount	75%	25%	25%
Copper (usual am't. burrs) disc.	35-12½%	Add 30%	Add 30%
Copper, burrs, discount	30-12½%	Add 50%	Add 50%
Rope			
Pure Manila, base, lb.	.15	.39	.28½
British Manila, base, lb.	.11	.33	.24
Sisal, base, lb.	.10½	.27½	.25½
Cotton, ¼ in., and larger, lb.	.24	.71½	.74
Soldering Coppers, base, lb.	.28	.64	.58
Packing, fine jute, lb.	.08¾	.20	.20

Sheets The Goods.	The Prices. Aug.1, 1914.	Aug.1, 1918.	Nov.9, 1918.	Jan.15, 1919.
Black, per 100 lbs., 10 gauge	$2.45	$10.00	$....	$7.50
12 gauge	2.50	10.10	9.60	7.35
14 gauge	2.25	7.90	8.40	7.20
18-20 gauge	2.40	7.55	8.30	7.30
26 gauge	2.55	7.65	8.40	7.40
28 gauge	2.70	7.75	8.50	7.50
Galvanized, per 100 lbs., 14 gauge	2.80	8.35	10.85	8.15
18-20 gauge	3.20	8.60	11.10	8.40
U.S. 26 gauge	3.55	8.90	11.40	8.70
U.S. 28 gauge	3.90	9.20	11.70	9.00
10¾ oz.	4.20	9.50	12.00	9.30
Solder				
Strictly, per lb.	0.21½	0.55½	0.47	0.38
Guaranteed, per lb.	0.23	0.60	0.50	0.40

WHAT ANOTHER WAR SHOWED IN THE WAY OF PRICE CHANGES

There has been so much written upon the question of the effect of war on prices, and the probable effects of peace, that the evidence of comparative prices, prior to the American Civil War at its conclusion and some years later, should be interesting reading. The prices are derived from "Hunt's Magazine" of January, 1868, and represent New York quotations at the beginning of the years given. The price of gold is also given so that it is possible to measure the depreciation in currency:

	1861.	1865.	1868.
American gold	Par	$ 2.27	$ 1.33½
Ashes, pots 100 lbs.	$ 5.00	11.75	8.25
Wheat flour, state, bbl.	5.35	10.00	10.00
Wheat flour, best Gen.	7.50	15.00	14.50
Cornmeal, Jersey	3.15	8.80	6.15
Wheat, white Ohio	1.45	2.60	3.00
Wheat, red Western	1.38	1.06	2.40
Oats, state	0.37	2.45	0.80
Corn, Western	.72	1.90	1.35
Cotton, mid. up	.12½	1.20	.16
Fish, dry cod, 100 lbs.	3.50	9.00	5.50
Fruits, currants, lb.	.04½	.21	....
Bunch raisins, per box	1.75	5.85	3.80
Hops, per pound	.25	.40	.65
Iron, Scotch pig, ton	21.00	63.00	36.00

	1861.	1865.	1868.
Iron, English bars, tons	$52.00	$190.00	$85.00
Laths, per thousand	1.30	2.40	3.00
Lead, Spanish, per ton	5.25	15.00	6.50
Leather, hem., sole, lb.	.10½	.42	.28
Lime, per barrel	.75	1.15	1.85
Molasses, New Orleans	.37	1.43	.85
Oil, crude whale, gal.	.51	1.48	.70
Pork, old meas., bbl.	16.00	43.00	21.15
Horns, per lb., pickled	.08	.20	.13
Butter, state	.18	.55	.45
Rice, good, 100 lbs.	4.00	13.00	6.50
Salt, Liverpool, gr., etc.	.65	2.27	.50
Sugar, Cuba, good	.06¼	.19	.11⅞
Wool, fleece	.30	.95	.60

It will be noticed that the declines as a rule were gradual, being higher in most instances in 1866 than at the beginning of 1868. In 1866, with gold at $144½, cotton was quoted at 52 cents a pound, English bar iron at $130 a ton, laths at $5 per thousand, Spanish lead at $10 per ton, old mess pork at $28.50 per barrel, sugar at 13 cents a pound and fleece wool at 75 cents a pound. Wheat and corn, however, were cheaper in 1866 than in 1868, white Ohio wheat being quoted at $2.63 at the beginning of 1866.

VISITOR TO CANADA

W. L. Rolf, the founder and manager of the Rolf Heater Co., of Columbus, Ohio, was in Toronto recently making business arrangements to ship their products to Canada. He reports having had a very successful trip. During his stay in a number of Canadian cities before the war his concern did considerable business in Canada, but on account of the restrictions on certain metals they had to discontinue shipping their line out of the United States. Mr. Rolf is very favorably impressed with the Canadian business outlook.

EXHIBITING AT LYONS FAIR

The Goderich Organ Co., Ltd., has made a shipment of closet seats and tanks to the exhibition to be held in the city of Lyons, France, in March next. This fair has become an annual event and is visited by buyers from all parts of the world. The Government has secured 40 booths, which are being allotted to manufacturers who are looking for export trade. The Goderich Organ Co., Ltd., has a quarter section, and hopes for good results from this exhibit.

AN OMISSION

Under the heading "New pipe wrench attachment," an article appeared on page 28 of the January 2nd issue of SANITARY ENGINEER. The name of the manufacturer was inadvertently omitted. Any information regarding the attachment referred to may be procured from Kroeschell Bros. Company, 470 Erie Street, Chicago.

ADVANCE PRICES FOR WORK IN PRINCE RUPERT

The following communication reached us recently to the effect that sanitary and heating engineers in Prince Rupert have had to make a change in prices charged for work done.

"Owing to increased cost of labor and overhead expenses it has been necessary for us to increase our charges to one dollar and twenty-five cents per hour from 8 a.m. to 5 p.m. with time and one-half for overtime until 12 p.m.

(Signed)

SMITH & MALLETT,
STEEN & LONGWILL,
HARRY HANSON,
HENRY LETOURNEAU."

ELECTED TRUSTEE OF BOARD OF EDUCATION, TORONTO

Many of the readers of SANITARY ENGINEER will be interested and pleased to know that Joseph (Joe) Bell, the worthy representative of Warden King, Ltd., was elected one of the trustees of the Board of Education, Toronto.

Everybody in the trade knows Joe, and thousands of Torontonians have called upon him from time to time when having trouble with their heating systems.

Mr. Bell has had a practical education, having been in the business for upwards

"JOE" BELL
Representative of Warden King Ltd. Recently elected Trustee to Toronto Board of Education.

of 23 years, which no doubt will serve him in good stead as a servant of the public of Toronto. And if he takes up the new duties with as much zeal as he puts into his everyday life, the Board of Education will find in him an invaluable addition to their membership. No better and fairer member of the heating trade can be found, and we wish him every success.

The time was never more opportune than now for men with real brains to aspire to municipal honors in Toronto. There is not one department that is not wasting hundreds of thousands of dollars every year, all because of the clique in power at the Toronto City Hall, a state of affairs which is really perpetual.

WASTAGE OF FUEL

"Sufficient is being wasted by the users of fuel oil in one year to run all the railways of the United States for one month." Such is the conclusion drawn by experts of the Bureau of Mines, who have co-operated with the Fuel Administration in a general survey of the use of fuel oil for power purposes in the United States. Further, the experts say that the forty million barrels of oil so lost each year are equivalent to 10 million tons of coal. As one result of the investigation, a handbook for boiler plant and locomotive engineers on the efficient use of oil fuel has been issued by the Bureau of Mines, giving instructions to all those who have oil-burning plants. A free copy of these instructions has been forwarded to all known plants using fuel oil.—"American Gas Engineering Journal."

NEW OIL BURNER

The more extensive use of oil fuel offers a partial solution to the coal shortage (in the U.S.A.). A description is given of the Ray Oil Burner, which, it is claimed, can be used in anything from a residence hot-air furnace to a 500 h.p. steam boiler.

Steam and air atomization is said to be wasteful of oil. Air atomization requires complex equipment, and steam atomization is only feasible, it is stated, for high-pressure work. The Ray burner utilizes mechanical atomization. The oil is atomized in a horizontal open cup driven at 3,450 r.p.m., air being forced at high velocity around the cup and in a direction away from it. Guide vanes impart rectilinear motion to the air and oil mixture. An electric motor with hollow shaft is utilized to drive the burner, and the totally enclosed motor-frame is cast hollow so that oil may be passed continuously through the casing. This secures the double advantage of cooling the motor and warming the oil. With the exception of domestic stoves, fuel oil as low as 14 degrees gravity can be burned without smoke, soot, or dirt.—"Electrical Review."

GAS WELDING FOR BOILER TUBES

"Bagged" and leaky boiler tubes may be repaired by oxy-acetylene welding. As many as fourteen welds have been made in one tube before discarding the latter. The "bag" on the tube is heated slowly by the torch until it is a bright

cherry red and then driven back, beginning at the edges and working towards the centre. The leak, if any, is first welded up. Sections of sound tube are welded on to damaged tubes. Including labor, material, and cost of setting up, the total cost is about 75 cents per weld. The oxy-acetylene torch may be used to anneal crystallized tubes. — "Electric Railway Journal."

HOW MANY OF THESE RULES DO YOU APPLY IN YOUR BUSINESS?

The National Association of Credit Men, which now has a membership of more than 20,000, recommends the following rules for merchants for figuring costs and profits:

1. Charge interest on the net amount of your total investment at the beginning of your business year, exclusive of real estate.
2. Charge rental on real estate or buildings owned by you and used in your business at a rate equal to that which you would receive if renting or leasing it to others.
3. Charge in addition to what you pay for hired help an amount equal to what your services would be worth to others; also treat in like manner the services of any member of your family employed in the business not on the regular payroll.
4. Charge depreciation on all goods carried over on which you may have to make a lower price because of change in style, damage, or any other cause.
5. Charge depreciation on buildings, tools, fixtures, or anything else suffering from age or wear and tear.
6. Charge amounts donated or subscriptions paid.
7. Charge all fixed expenses, such as taxes, insurance, water, light, fuel, etc.
8. Charge all incidental expenses, such as drayage, postage, office supplies, livery expenses of horses and wagons, telegrams and telephones, advertising, canvassing, etc.
9. Charge losses of every character, including goods stolen or sent out and not charged, allowance made customers, all debts, etc.
10. Charge collection expense.
11. Charge any other expense not enumerated above.
12. When you have ascertained what the sum of all the foregoing items amount to, prove it by your books, and you will have your total expense for the year; divide this figure by the total of your sales, and it will show you the per cent. which it has cost you to do business.
13. Take this per cent., and deduct it from the price of any article you have sold, then subtract from the remainder what it cost you (invoice price and freight), and the result will show your net profit or loss on the article.
14. Go over the selling prices of the various articles you handle and see where you stand as to profits, then get busy in putting your selling figures on a profitable basis and talk it over with your competitor as well.

DRINKING FOUNTAINS IN WINNIPEG

The accompanying illustration gives the reader an idea of the type of sanitary drinking fountains which are located in the streets of Winnipeg. Winnipeg is blest with men at the head of its various health departments who are

Two Styles of Drinking Fountains Used in Winnipeg.

gifted with advanced views, aggressive in many ways and never slow to voice their opinions publicly. In that way they invariably receive a sympathetic hearing. Winnipeg has several of the finest public comfort stations on this continent in use, and we hope to report that more will be erected when conditions become normal.

PLUMBER AND AUTHOR

We do not often come across a member of the trade who turns his hand to writing a book. But even so, one must make a success in his or her first undertaking before they can ever hope to succeed in a second.

Coming to Canada from Scotland in the year 1905 W. C. Millar went to work in

PTE. W. C. MILLAR
Plumber-author of "From Thunder Bay Through Ypres With the Fighting 52nd."

Winnipeg at his trade, a few years later striking out to the twin cities as foreman of the Fort William Plumbing and Hardware Co., and a year later establishing a partnership business known as Millar & Silk.

Mr. Millar was so well liked by the trade that he was elected delegate to represent the Fort William Society of Sanitary Engineers at the convention held in Calgary in 1912. One year or so later Mr. Millar took over the business and conducted same until the year 1915, when he joined the 52nd Battalion of Fort William. So much for the plumbing side of his experience. We will now turn to his career as an author. Pte. W. C. Millar returned home and having no doubt taken notes of his experiences at the front, he decided to write about the things he saw and a few of the hair-breadth escapes he, as well as a number of his comrades in arms, had on the battlefield.

The Book

The book is entitled "From Thunder Bay Through Ypres with the Fighting 52nd." It is a book of twenty-one chapters. It is well written and is more after the style of a diary.

The reader is carried along in a very vivid fashion all the way from Fort William to the various battlefronts. There are of course a number of comrades introduced to the reader, and as one reads one feels that he is really one of the members of the "Fighting 52nd." The screech of the shell can be heard and the "claggy" (sticky) mud can almost be felt as one reads on.

Private W. C. Millar has published this book of his experiences and is trying to interest every member of the trade in it by selling them a copy, and with this aim in view SANITARY ENGINEER is introducing the book to its readers.

Those desiring to procure a book containing certain phases of the war, written by one of their own members, should write to the author at his address, 339 North Norah Street, Fort William. The price is $1.00, postage prepaid.

NEW PATENTS

Continued from page 41

accommodated within said plunger casing, said plunger being adapated, when raised, to move said ball to close said outlet orifice, and said ball being capable of retention in such closing position at a lower pressure than that required to raise said plunger, and a slidable member, operable beneath said plunger, having a restricted passage therein through which fluid is admitted to said pulnger.

3. In a device of the class described, a ball casing, a plunger casing communicating therewith, said ball and plunger casings having outlet and inlet orifices therein respectively, a ball within said ball casing, a tubular seat between said casings for said ball, said seat having passages therein whereby fluid may pass through the device when said ball is at rest, and a plunger having a stem slid

able in said tubular seat to move said ball to close said outlet orifice, said ball being capable of retention in such closing position, at a lower pressure than that required to raise said plunger.

4. In a device of the class described, a ball casing, a plunger casing communicating therewith, said ball and plunger casings having outlet and inlet orifices therein respectively, a ball within said ball casing, a tubular seat between said casings for said ball, said seat having passages therein whereby fluid may pass through said device when said ball is at rest, a plunger having a stem slidable in said tubular seat to move said ball to close said outlet orifice, said ball being capable of retention, in such closing position, at a lower pressure than that required to raise said plunger, and a slidable member, operable beneath said plunger, having a restricted passage therein through which fluid is admitted to said plunger.

COAL CHEAPER THAN ELECTRICITY FOR HEATING

If the Whole of Niagara Falls Were to be Converted Into Electricity, There Would Not be Sufficient to Heat All the Homes in Toronto—Electricity is a Power Energy

A BULLETIN just issued by the Advisory Council for Scientific and Industrial Research on possibilities of electric heating for domestic purposes in Canada disabuses the public mind of a somewhat widespread idea that electricity will eventually take the place of coal and thus solve the fuel problem. The bulletin, prepared by Mr. Barnes, of the Hydro-Electric Power Commission of Ontario, covers in clear and concise manner the main facts as to comparative costs of domestic heating by coal and by electricity, and reaches the conclusion that, while electric heaters will prove valuable as coal savers in mild weather and for other auxiliary purposes, "it is hard to conceive of a time when electric energy will compete successfully and on a large scale with coal, oil, gas, etc., for heating.

The future of hydro-electric development, acording to the bulletin, lies mainly in its use for mechanical power purposes. Coal must continue to be the people's main reliance for heating purposes in climates such as that of Canada.

After noting the popular idea that the immense water-power of Canada will eventually be used to solve the growingly acute fuel problem and that some ingineers "who ought to know better" have been giving out hints that sooner or later electricity would come to the rescue, Mr. Barnes proceeds to point out the scientific and economic difficulties in the way. He gives facts and figures as to typical cases where electric heating might be substituted for coal. In the City of Toronto, for instance, where there are about 80,000 homes, the heating requirements for houses alone would be equivalent to about 960,000 horse-power, while the entire Niagara output is now only 780,000 horse-power. About 6,000,000 horse-power represents the whole possible development of Ontario water-powers, which is quite inadequate to supply even the existing homes of Ontario with electric energy for heating alone, exclusive of all other domestic, commercial and industrial requirements.

Furthermore, he points out that the market for electric heating is only in the winter time, and for the summer months there would be nothing to provide a market for the output of the enormous and costly plants which would have to be built.

On present Toronto rates for electric heating Mr. Barnes finds that for an eight-roomed house the cost would figure out to about $375 for the season's heating, as compared with nine tons of coal, costing, say, $90. Even if supplied of the lowest existing power rates, viz., at Niagara Falls, the cost of electric heating would be more than one and one-half times that of heating with anthracite.

As to future possibilities in the way of more economic methods of fuel using, Mr. Barnes points out that there is no room for improvement through the cutting out of waste in electric heating, since all the energy is now utilized, but in the matter of coal, engineers still have from 15 to 60 per cent. "waste" as a margin for improvement and consequent reduction of costs.

In any event, the cost of coal would have to rise to not less than $15.50 per ton before the cost of heating by means of it would be equalled by that of heating by electricity even at the low rate of 0.35 per kilowatt hour.

The bulletin notes, however, that "the use of electric heaters as auxiliaries to other systems to warm up an otherwise cold room, or during chilly periods in the spring and autumn when the furnace is hardly needed, will prove in very many cases a great convenience; and, provided that the periods of use be short, e.g., for an hour or two in the morning or evening, it will be almost as economical to use electric energy in this manner as to light a fire in the furnace, and very much less trouble.

"Again, at present rates for electric current, it is likely that considérable reductions may be made in the cost of electric heating by the judicious use of electric fans to thoroughly circulate the air from the heater and bring all parts of the room to approximately the same temperature; the extra cost of current required for a fan is very small compared with the advantage to be gained."

REPORT OF WINNIPEG PLUMBING DIVISION FOR DEC., 1918.

Permits Issued

56

Inspections

Water Tests	Smoke Tests	Subsequent Inspections	Miscellaneous Inspections	Defects Rectified
42	72	258	13	130

Sewer Division

Permits issued	Connections constructed	Inspections
5	8	30

Sewer Maintenance Division

Tank Flushings Gallons	Hose Flushings Gallons	Total Gallons of Water Used
1,362,432	700,625	2,063,057

PRACTICAL SHEET METAL WORK

Continued from page 43

line joining 5 C, with point C as a centre, and B A on elevation as a radius, draw an arc; with X 5 at angle A as a radius, draw an arc intersecting one drawn from C, obtaining point D; then draw lines joining C D and D 5. With D as a centre, and the different points, X 5, X 4, X 3, X 2, and X 1, as radii, draw arcs intersecting each as drawn with arc drawn from last obtained points the radius of this arc being one division of circle on plan.

When point 1 is obtained, draw a line joining D as a centre and D E on plan as a radius, draw an arc. With point 1 as a centre and A D of elevation as a radius, draw an arc intersecting the one drawn from D, obtaining point E. Draw lines joining D E and E 1, thus completing outline of pattern as 1, E, D C, B A 1.

Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published--Description of Jobs Done or Shop Kinks Are Also Invited.

WILL THIS JOB WORK?

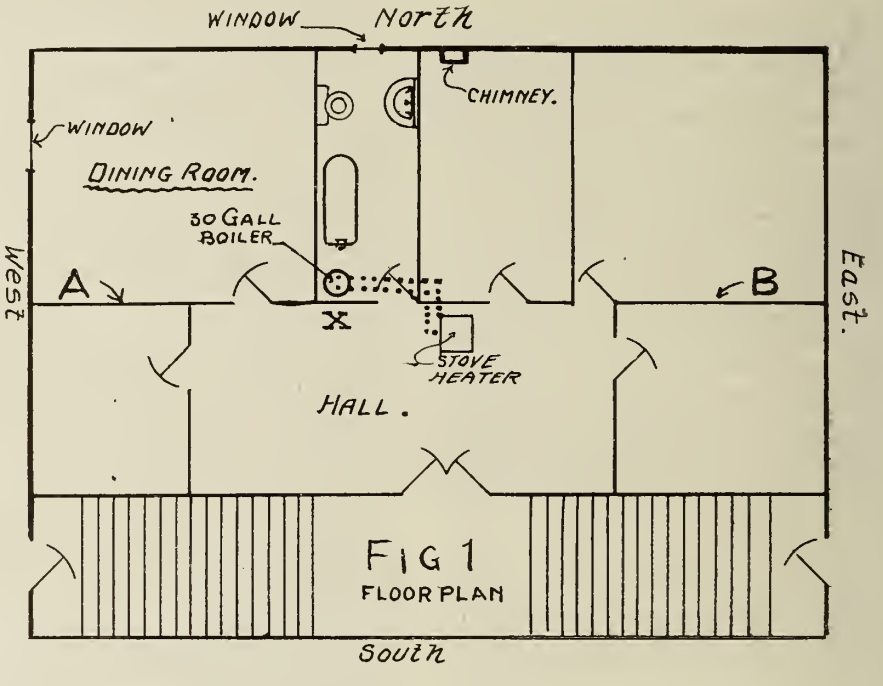
Editor Sanitary Engineer,—I am sending you herewith a rough sketch of an overhead residence, and would like to know if it is possible to heat the range boiler as located in the bathroom by connecting a pipe running from the heater over the top of the door to the top of the boiler and another pipe from the bottom of the boiler under the floor to the stove, or, would this cause the water to pound or make a noise in circulating from the stove to the boiler? I would like to be able to have the stove located where shown in sketch so as to assist in heating the front rooms more comfortably. The boiler is located about four feet from the stove and the pipes will have to be raised about 4¾ feet, then drop a few inches to the top of the boiler. The boiler is fed from a cistern situated close to the ceiling in the bathroom (not shown on sketch). If the stove cannot be so connected as shown by dotted lines going over and under the door, can the boiler be located in place indicated by a cross?—R. J. T.

In Fig. 1 our readers will note the sketch submitted by R. J. T. The dotted lines shown give one a rough idea of the way the pipes are required to be installed, though if there is no serious objection we would suggest that the pipes all be run on the outside of the wall, then only one wall will have to have pipes passing through instead of as shown in Fig. 1, which shows the pipes passing through two walls. Of course by having the pipes from the heater pass through the wall behind the heater, no pipes will be seen in the hall.

Fig. 2 shows an elevation wall plan, the dotted lines describing both the pipes and boiler more clearly at a point indicated at A and B in Fig. 1. The cistern on the ceiling is also shown.

Fig. 3 is an enlarged view of the location of boiler, cistern, stove and piping. It will be noted that the pitch of the pipe is all in one direction from the top pipe at the heater to the boiler, and then the return pipe under floor slopes up to the heater.

Great care must be taken that no pipes are trapped. By looking carefully over



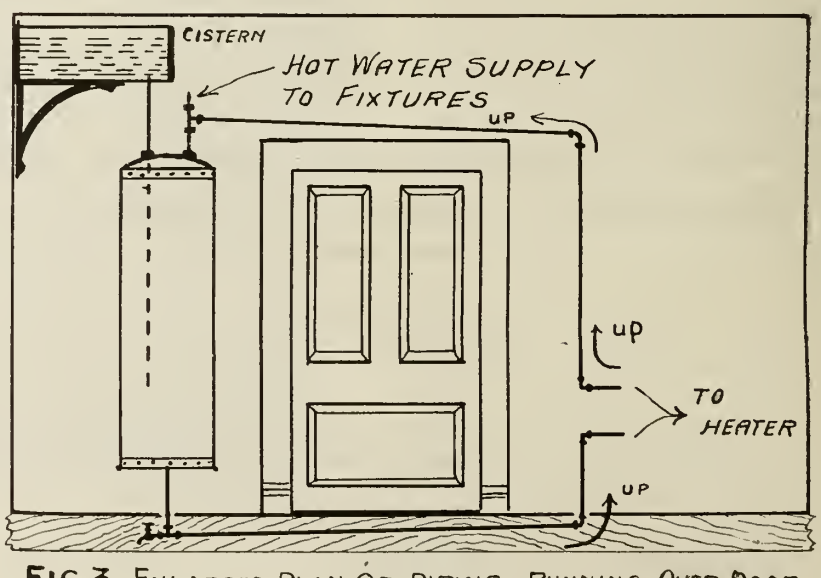


FIG 3 ENLARGED PLAN OF PIPING, RUNNING OVER DOOR AND UNDER FLOOR.

FIG 2 SHOWING WALL PLAN AT A. AND B. IN FIG 1

the piping plan and following out the principle that no matter how many crooks or bends are required to get the heater connected, all the pipes must slope in the direction shown. The pipe to the fixtures being taken off at the highest point will eliminate any cause that would result in water hammering. Of course it may be that if there is too much coil placed in the heater and not enough hot water drawn off the boiler, there is a likelihood of the water boiling and when cold water flows from the cistern, a number of slight explosions, or noises, will be experienced. This can only be overcome by taking care not to have too much coil in the heater.—Editor.

HOW SHOULD THESE FIXTURES BE VENTED?.

Editor Sanitary Engineer,—I have just been awarded a contract to instal two sets of water closets and wash basins, three water closets and three wash basins in each set, with one extra water closet and one wash basin at side in a smaller compartment. Would you kindly let me know which you think would be the best way to vent the above fixtures. Enclosed please find a small sketch which will give you an idea of what I require.—W. J. N. V., B.C.

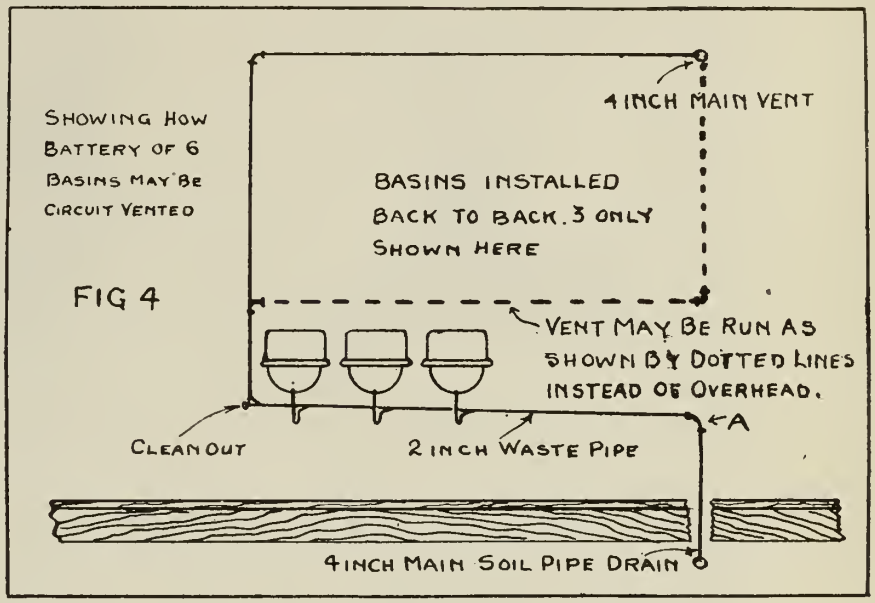
Fig. 1 is a reproduction of the sketch submitted by our inquirer. It will be seen that the six wash basins are to be installed back to back and that the seven water closets are practically in a battery. Our inquirer however has not informed us whether or not there exists a plumbing by-law in his district, but, if there is, then of course the by-law in force must by all means be followed.

He informs us that he has been awarded the contract and this being the case he no doubt desires to instal the work in as practical and inexpensive a manner as possible. We are therefore advising the most modern method that can be adopted, known as the simplified system of plumbing and venting.

Fig. 2 shows a general plan of the soil and waste pipes, describing the position of the various fittings to receive the circuit vent pipes for both the water closets and basins.

Fig. 3 shows an elevation plan of the seven water closets in battery, with the piping of the drain as well as the loop or circuit vent. This elevation also shows

(Continued on page 54)


SHOWING HOW BATTERY OF 6 BASINS MAY BE CIRCUIT VENTED
FIG 4
4 INCH MAIN VENT
BASINS INSTALLED BACK TO BACK. 3 ONLY SHOWN HERE
VENT MAY BE RUN AS SHOWN BY DOTTED LINES INSTEAD OF OVERHEAD.
A
CLEAN OUT
2 INCH WASTE PIPE
4 INCH MAIN SOIL PIPE DRAIN

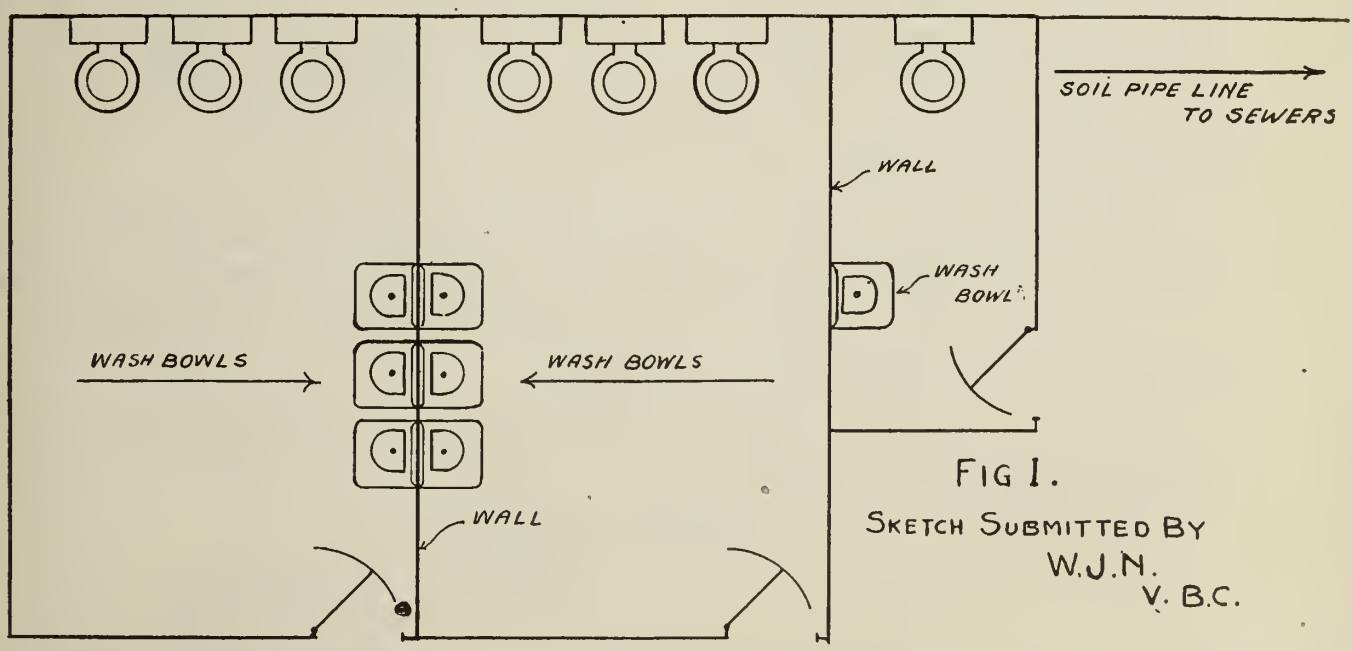


FIG 1.
SKETCH SUBMITTED BY W.J.N. V. B.C.

FULL INSTALLATION CONSISTS OF 7 W.C.S AND 7 WASH BOWLS

SANITARY ENGINEER RECEIVED TESTIMONIAL FROM PROFESSOR OF PHYSICS

DEPARTMENT OF PHYSICS, O.A.C.
GUELPH, January 6th, 1919.

Editor, "Sanitary Engineer,"
Toronto, Ont.

Dear Mr. Newsome:

I have been a subscriber to "SANITARY ENGINEER" for about five years, and I wish to say that I have always looked forward with great pleasure to the arrival of every issue, and I have never been disappointed. The reason for my interest in it is that it contains good articles on such subjects as sewage disposal and water systems for rural homes, water supply and means to keeping it pure, science and practice of pumps and pumping, humidity in relating to private homes, windmills, science and practice of plumbing, heating systems for private homes, and ways and means of conserving fuel, and advanced ideas regarding systems of plumbing and sanitation. The Query and Answer Department of the publication always contains valuable information in a specific manner on practical problems pertaining to water supply, ventilation, heating, pumps and pumping, sewage disposal, right and wrong ways of plumbing, etc., etc., all of which are most interesting and often valuable to the practical physicist like myself who teaches the science of these subjects more or less, and almost every day receives queries from farmers and others regarding such problems

I have always, too, been impressed with the thought that this publication strongly encourages, by its editorials, articles and correspondence courses, better education and greater efficiency for those men actually engaged in putting in our water-systems, plumbing fixtures, sewage disposal plants, heating systems, etc. Since all these parts of the equipment of a modern home are so essential for comfort and happiness and are also costly, does it not seem reasonable that they should be installed by experts who know all about them from A to Z? No intelligent plumber, it seems to me, can read this publication sincerely without carrying more intelligence, more interest and more efficiency into his actual labors day by day. These are the things that cause him to realize that he is more than a mere laborer with his hands for the public, rather he is giving real and permanent service to the State, he is a benefactor of a high order.

Personally I believe that every man who owns a home would be greatly benefited by having a good knowledge of the science and management of his furnace, the plumbing fixtures, methods of heat, and moisture control, etc. I know of no more valuable source of information on such problems and kindred ones than "THE SANITARY ENGINEER," published semi-monthly by The MacLean Publishing Co., Ltd., Toronto.

I am enclosing a letter from a correspondent, which I wish you would answer for me, and you may put it in your query column. Please return letter and send answer direct to me.

I am,
Yours sincerely,
(Signed) R. R. GRAHAM,
Lecturer in Physics and
Sanitary Science

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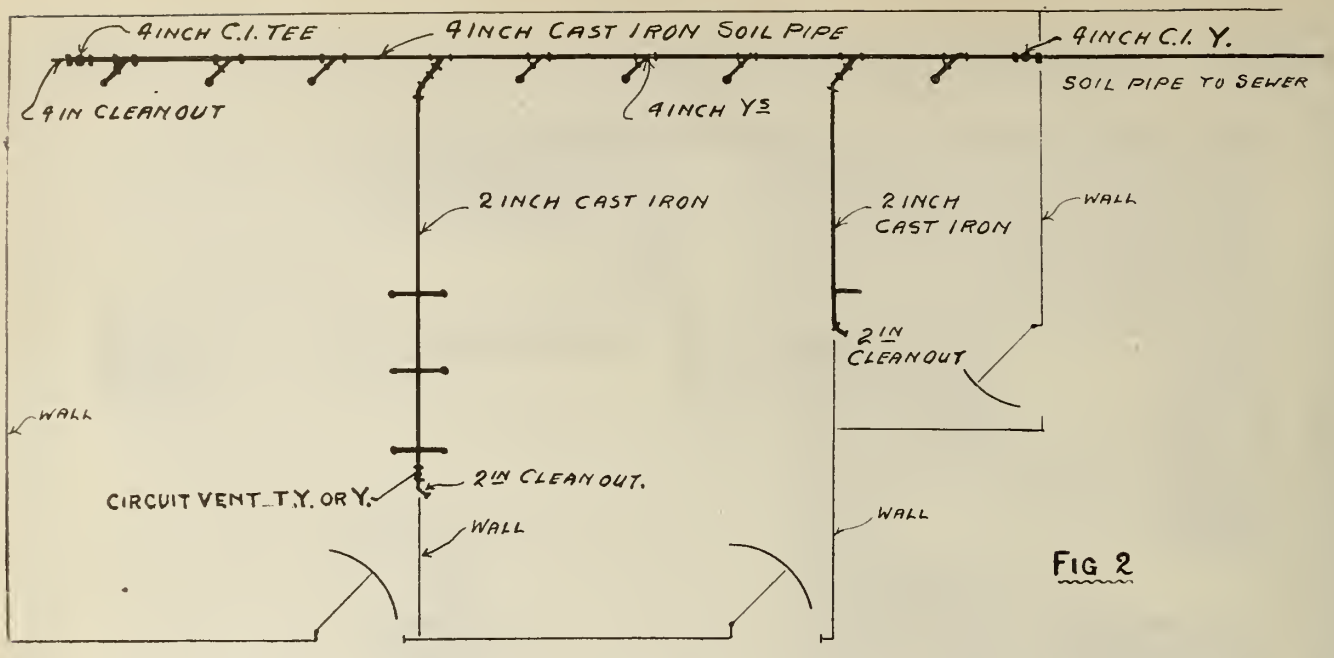


FLOOR PLAN OF SOIL AND WASTE PIPES SHOWING CONNECTIONS UNDER FIXTURES

QUESTION BOX

(Continued from page 51)

where the circuit vent from the wash basins enters the main loop vent. It also describes the proper location for cleanout plugs, one at the foot of the soil pipe, and one at the extreme end of the soil pipe to the left of the first water closet. If our readers will note they will see a number of dotted lines at this end showing how, if desired, the cleanout plug may be extended to the floor on which the water-closets are installed. This would make it very handy to clean out if ever the vertical stack became clogged up.

The fittings to be used under the water closets would comprise a regular 4 x 4 C I Y, a long cast iron bend, a brass ferrule and a piece of 4-inch lead waste pipe to the floor into which the water closet bowl would be fitted. Or, if the depth between the top of the floor and the horizontal soil pipe is not too great, it may be possible to use long lead bends and the brass ferrule and C I Y.

This and all such horizontal soil pipes must be well supported by the use of good stiff hangers.

We will now turn to the elevation plan, Fig. 4. This describes how a battery of wash basins may be installed by circuit venting in the same way as the water closets are vented. If our inquirer desires he may install a horizontal waste pipe under the floor and run a separate vertical waste and vent for each basin, connecting all the vents into a 2-inch horizontal vent in something like the manner shown in Fig. 3. This of course is simply a side view of the piping shown in Fig. 4.

Then again, the circuit vent may be run up to the same height as main vent over the water closets if necessary, or as an alternate method, the plan shown by the dotted lines may be followed out.

If one horizontal waste pipe is installed as shown in Fig. 4 it will be necessary to fit a cleanout into the extreme end as shown, and it would not be a bad idea to put in a 2-inch fitting and cleanout plug at A, so that this waste pipe could be cleared out easily. There are far too few cleanout fittings used in plumbing construction, but this, the writer believes, is due to the fact that there are very few on the market that can be depended upon.—Editor.

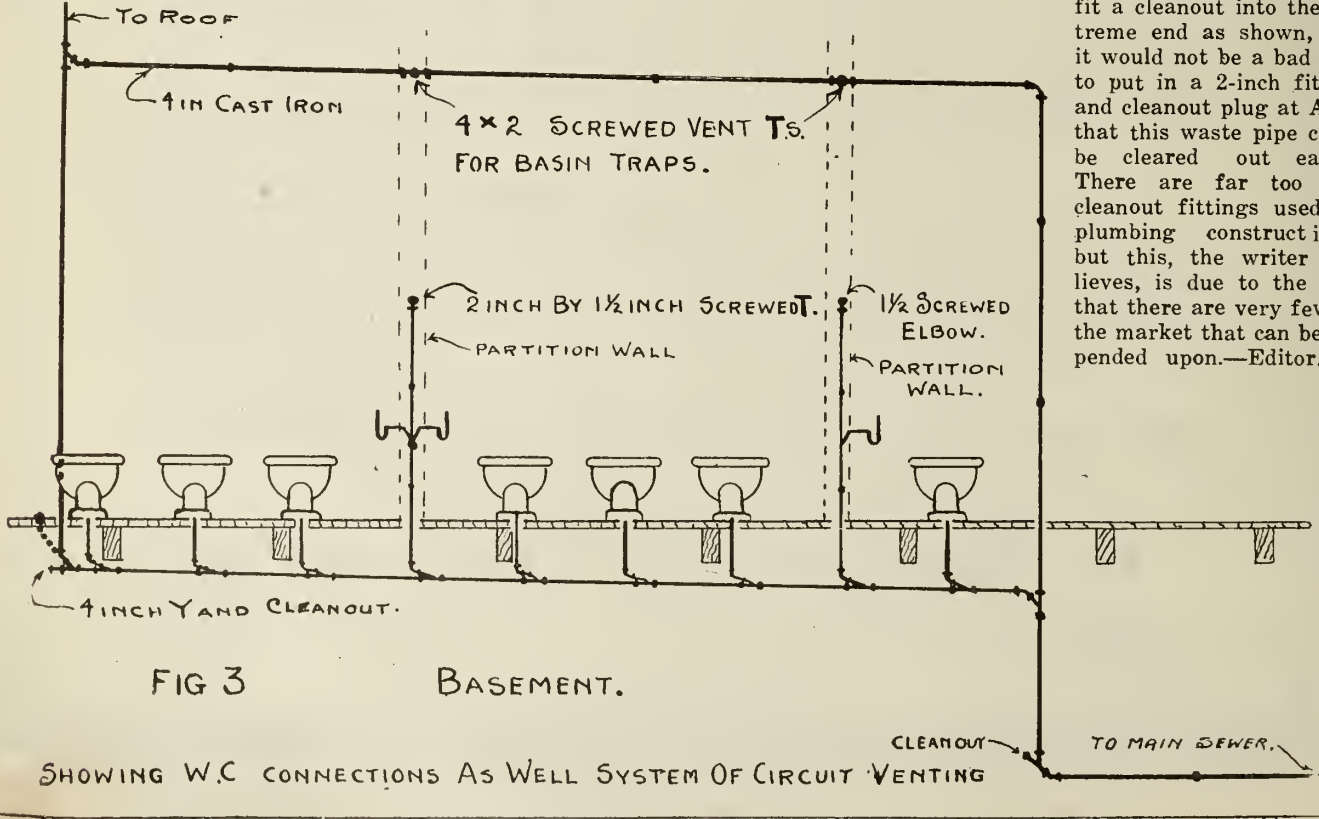
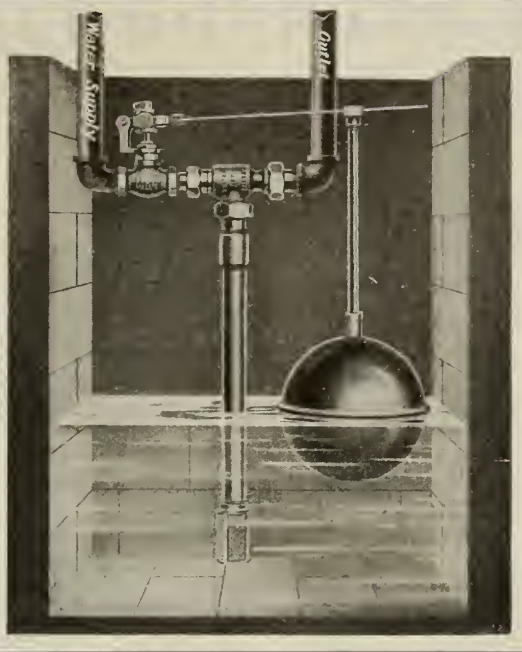


FIG 3 BASEMENT.

SHOWING W.C CONNECTIONS AS WELL SYSTEM OF CIRCUIT VENTING

"MORRISON" AUTOMATIC CELLAR DRAINER

A simple, uncomplicated device that performs a necessary and useful service. Easy to install, requires no attention, nothing to get out of order, and possessing a greater lift than any other Cellar Drainer on the market to-day.



The trade is demanding this Cellar Drainer. The reputation of Morrison products and the Morrison guarantee back of it is its assurance of dependability. There are splendid profits in it and it's easy to sell. Write us for prices and particulars.

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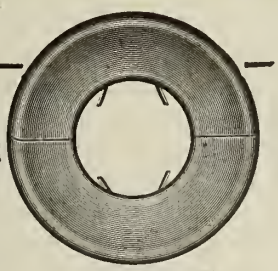

TOP VIEW NO. 10-A.

THE NO. 10—A NARROW FLANGE PLATE IS A STEEL HINGED PLATE. FLANGES ¾" WIDE. HIGHLY FINISHED. ESPECIALLY DESIGNED FOR TWIN CONNECTION "NARROW."

The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

High quality at the right price.

Gem No. 4.

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Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

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Folly to Hold Off for Lower Prices

Duty of Business is to Go Ahead, Says J. E. Otis; No Big Decline in Sight

A TENDENCY on the part of business men to hold back new enterprises, in expectation of lower commodity prices and wages, is a mistake, in the opinion of Joseph E. Otis, vice-president and acting head of the Central Trust Company of Illinois.

"I have no sympathy with the man who is sitting back, awaiting lower prices," said Mr. Otis to-day. "The people who are awaiting a drastic decline in prices aren't going to get it, they are going to get left. In other words, I do not believe we are going to see any immediate and drastic decline in commodity prices. There is a world-wide scarcity of many materials and production costs are going to continue abnormally high.

"We have had perhaps a certain amount of inflation. To the extent that present high prices are due to that cause, moreover, we can expect no immediate decline. The process of deflation will be gradual.

"If we are all to hold back, awaiting lower prices, we should produce conditions of a sort that would benefit no one. It is the duty of business to go ahead and seize the opportunities now awaiting. If a manufacturer were to defer building needed additions to his plant, in the hope of securing a lower construction cost at some indefinite time in the future, he probably would lose more profits on goods which he might have been producing and selling in the meantime than he will save on cheaper construction costs."

Frank W. Thomas, of A. O. Slaughter & Co., said to-day:

"In considering the outlook for commodity prices, we must bear in mind that wages are going to continue high for an indefinite time, and that European competition, formerly so keenly felt in our markets, is not going to be so severe as it was before the war. Wages have been advanced abroad with no immediate prospect of their return to the pre-war basis."

Frank A. Vanderlip, president of the National City Bank of New York, in an address delivered in that city last night, declared that it is possible to transfer 15,000,000 men now engaged in war activities to works of peace without greatly disturbing conditions.

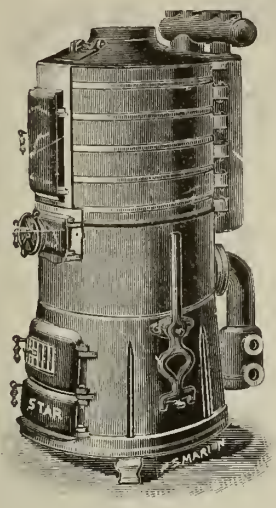
"I would not argue that we can make this transition without any jolt," he said. "There will be some. But I believe that the demand for labor is so great that it is possible to make the transition without disaster.

"We may make a cushion of public works. That is possible. But there are really tremendous orders that may now be executed, and on the whole I would not be surprised to find that we shall see no surpluses of labor, providing labor and the employer of labor each does his best to help in this readjustment."

John N. Willys, president of Willys-Overland Company, says:

"Material prices and wages are not likely to come down in a hurry. With the passing of the first flurry of unsettlement of prices which followed the signing of the armistice there is now a noticeable steadying of the market."

Thousands of Star Boilers in Use requiring repair Parts



It will be a long time before folks forget the coal troubles of the last few seasons.

The principal feature of the Star Boiler is that no other round hot water boiler has any coal-saving improvement not embodied in the "Star."

Then, too, while boiler installation and repair time is here, why not stock up with Star parts, for which O. Belanger has taken over the rights and is now making?

Many thousands of Star Boilers are in use requiring these repair parts hitherto unobtainable.

Write to us at once in time to catch the season's business.

We guarantee prompt deliveries.

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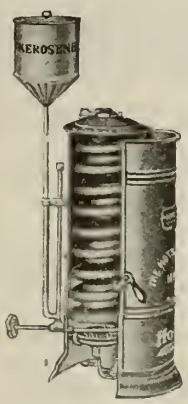
The Hotstream HEATS WATER FAST TRADE MARK REG. WATER HEATER

Kerosene Water Heater

Here is a REAL kerosene heater. Heaters as FAST and HOT as gas. Patented wickless burner generates its own gas and throws a clean, powerful, odorless, blue flame.

Will run over 12 hours on a gallon.

Burner absolutely noiseless. Send for descriptive folder.



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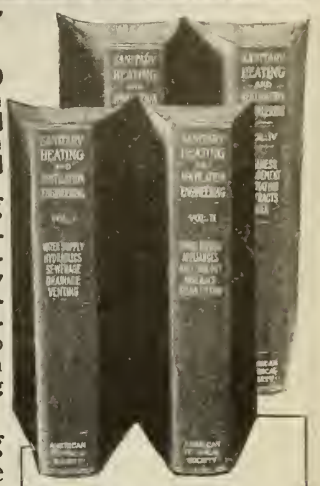

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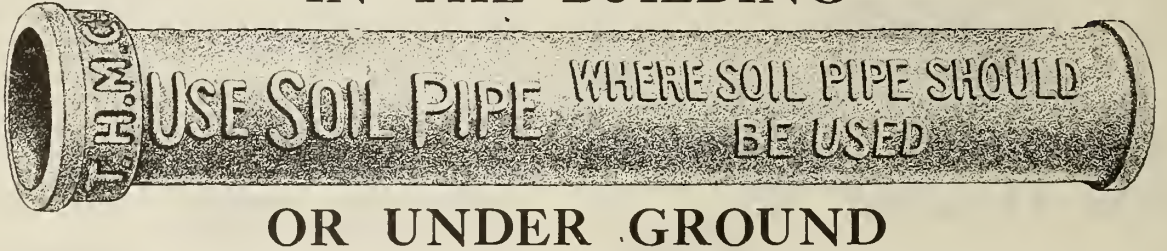

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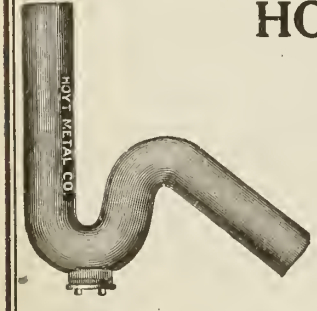

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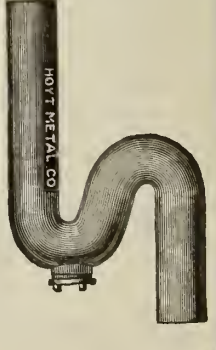

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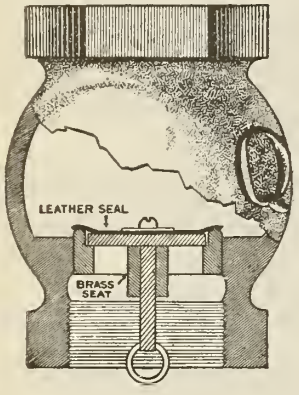

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ADVERTISING INDEX

A. & J. Mfg. Co. 64
Amherst Foundry Co. .Inside Front Cover
American Technical Society..... 57
Anthes Foundry Co. 9
Beaton & Cadwell 55
Beaton & Corbin 64
Belanger, O., Regd. 58
Borden Canadian Co. 64
Bicalky Fan Co. 64
Canadian Brass Co. 7
Canadian Consolidated Rubber Co., Ltd. 1
Can. H. W. Johns-Manville Co., Ltd., The 62
Canadian Tube & Iron Co..... 63
Canadian Wolverine Co. 6
Canada Metal Co. 32, 33
Chamberlain Desolvo Co. 6
Consumers Metal Co. 64
Dart Union Co. .....Inside Back Cover
Empire Manufacturing Co. .....
Outside Front Cover
Galt Brass Co.....Back Cover and 15
Goodwin, F., Co. 8
Gummer, G. & W. G., Ltd..... 2
Hause Mfg. Co., Chas. F..... 64
Hoyt Metal Co. 58
International Malleable Iron Co..... 11
Jardine, A. B., & Co..... 8
Katie Foundry, The 11
Kerr Eng. Co., Ltd.....Inside Back Cover
McDougall & Co., R. 60
McIntyre & Taylor, Ltd. 12
Morrison Brass Mfg. Co., Ltd., Jas.. 55
Mueller Mfg. Co. 53
National Equipment Co. 4, 5
Port Hope Sanitary Mfg. Co..... 16
Scaife & Sons Co., Wm. B..... 60
Simplex Manufacturing Co. 64
Spencer Heater Co. 13
Standard Sanitary Mfg. Co. 3
Steel & Radiation, Limited 10
Trimont Manufacturing Co..... 55
Toronto Hardware Mfg. Co..... 58
Wallaceburg Brass & Iron Co..... 10
Warden-King, Limited 63
Williams, J. H., & Co..... 12
X Laboratories 61

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How to Find Factory Costs $2.40

Industrial Organization 1.85

Handling Men 1.85

Over 60,000 Daisy Hot Water Boilers Now in Use—Are *You* Selling Your Share?

Daisy Hot Water Boilers are easiest to sell because they have an established reputation for exactly meeting the requirements of the modern home.

Every Daisy you instal will help build bigger business by bringing repeat orders for installation in neighboring homes later.

WARDEN KING Limited, Montreal

BRANCH OFFICE: 136 SIMCOE ST., TORONTO

WROUGHT PIPE

BLACK and GALVANIZED. SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

ALSO NIPPLES Black and Galvanized All Sizes

Ask your jobber for CT Brand

CANADIAN TUBE & IRON CO., LIMITED

Montreal Works: Lachine, Can.

PIPE AND THE PUBLIC WELFARE

By R. C. McWANE

A Book Just Off the Press

Every sanitary engineer should be the possessor of this book. It deals with pipe-making of all kinds, cast iron, wrought iron, steel, wood and tile pipe. It is valuable because it gives the users of pipe a true idea of how pipe lasts under various conditions when in service.

Price $1.00 Postpaid

MACLEAN PUBLISHING CO., LIMITED, Book Dept., University Ave., TORONTO

Typical Way of Drilling Wall Holes
The average efficiency with this tool over hand drilling is 5 to 1 in both quantity and quality of work.

PHILLIPS SPRING HAMMER

THE FIRST AND ORIGINAL HIGH SPEED HAND DRILLING MACHINE

These tools are very simple in construction, and built to stand up to the wear and tear and hard knocks incident to every-day drilling of concrete. Can be quickly taken apart and put together by any workman, in field or shop, without possible error in reassembling. The machine is used with breast plate and two cranks for wall drilling and with two cranks and extension for drilling in ceilings and through floors. If desired it can be used with one crank, either right or left handed.

BORDEN CANADIAN COMPANY

110 Church Street - TORONTO

Typical way of Drilling Holes Overhead in Concrete Ceilings & Through Floors. Saves time and money. Every hole a finished hole.

"BC" COMBINATION COLD ROLLED STEEL Floor and Ceiling PLATES

Carried by the leading supply houses

No. 15

Puts just the right finish on that heating job

Send for catalog of complete line of "B. & C." goods.

No. 1 Valve

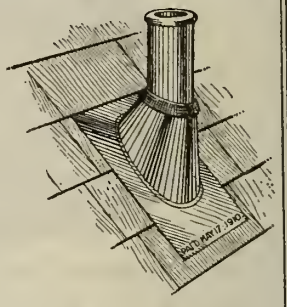
Stock carried by our Canadian Representative
W. H. CUNNINGHAM & CO.
183 Church Street
Toronto, Ont.

No. 16

No. 17

The Beaton & Corbin Mfg., Co.
Southington, Conn., U.S.A.
The Old Original Company

The SIMPLEX Adjustable Roof Flange



Fits any roof from ½ pitch to flat—just slide it down the pipe and it will conform with the pitch of the roof.

Trade Price 2" $1.00 4" $1.15

Made in all sizes—For sale by nearly every jobber

Simplex Mfg. Company - Chicago, Ill.

183 Church St., TORONTO, ONT.
Canadian Representative: W. H. CUNNINGHAM & CO.,

SAVE YOUR COUPLINGS

Write us what you have of the various sizes, either in pieces or pounds, and we will make you a cash price on them.

The A. & J. Mfg. Company

559 West Lake St. Chicago, Ill.

Second-Hand Pipe

1-2" to 4"

Black and Galvanized

Send us list of your requirements

Consumers Metal Company, Limited

14 St. John Street MONTREAL

Works: LACHINE, QUE.

"HAUSE" PIPE JOINT CEMENT

For steam, water, air, oil, gas, gaskets, etc. The cement that cements. Sets like gum. Allows no leaks.

The Great Value of "HAUSE PIPE JOINT CEMENT" lies in its peculiar chemical properties which permits of its hardening and expanding after the joints are made up. In making up joints it has the same effect as a lubricant on the best graphite, and while the joints may be made and broken readily, a perfectly tight joint is maintained at all times. Comes in 1-lb., 5-lb., 15-lb., 25-lb., 50-lb. cans, 100-lb. barrels. Manufactured in ready mixed and powder form. Ask your jobber for prices, or write us direct.

Made in Omaha, Neb., U.S.A.,

Manufactured in Ready Mixed and Powder Form.

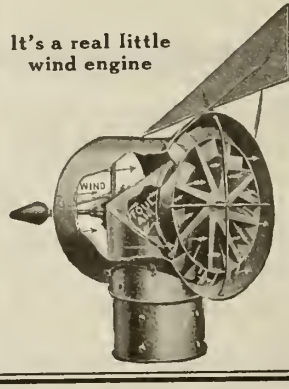
Canadian Distributors:

Empire Manufacturing Co., Limited

LONDON and TORONTO

THE BICALKY VENTILATOR

It's a real little wind engine



Is a positive suction fan that ventilates

The "Bicalky" will dispense with all auxiliary heaters on local ventilation systems.

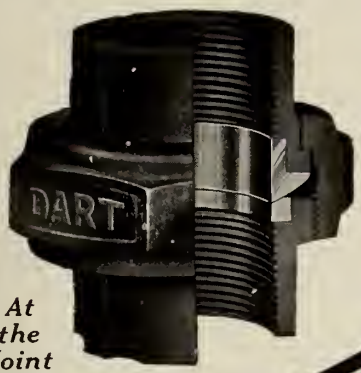
It is, as far as we know, the most scientifically constructed, self-propelled fan ventilator on the market.

Write us for full particulars.

BICALKY FAN CO.
BUFFALO, N.Y.

Canadian Sales Agents:
J. S. Chapman & Company
89 Jarvis St., Toronto

BRONZE TO BRONZE



At the Joint

DART

For Trouble-Proof Pipe Coupling Service

Dart Union Pipe Couplings never have to be retightened or replaced, because the Bronze Faces will not deteriorate and the Extra Heavy Iron Parts will not stretch or pull apart.

You will find it pays to use the "Dart," both from the standpoint of time and labor saved and satisfaction to customers.

SOLD BY ALL JOBBERS. ABSOLUTELY GUARANTEED.

Manufactured and Guaranted by

DART UNION COMPANY, Limited

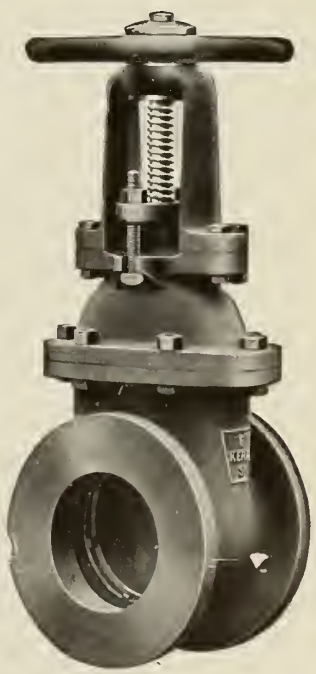
TORONTO, CANADA

There Are Lots of Gate Valves

Advertised and Sold

but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.

Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.

Approved by the Fire Underwriters' Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

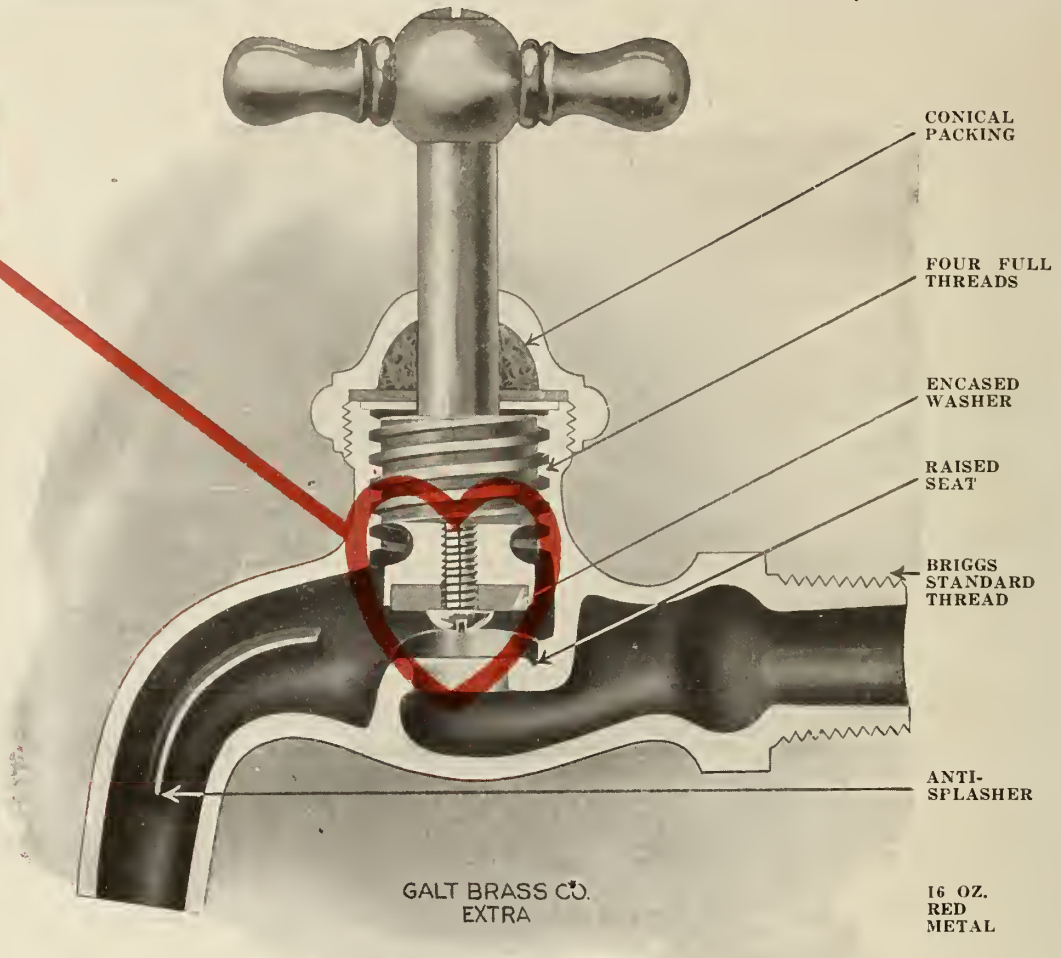
TRADE **PERFECTO** MARK

"GOOD" Washer

WARRANTY

Any article of our Manufacture proving defective will be replaced with TWO of its kind gratis.

Conical Packing, Four Full Threads, Encased Washer, Raised Seat, Briggs Standard Thread, Anti-Splasher, 16-ounce Red Metal



Better Than Ever!

All PERFECTO Compression Work is now fitted with the GOOD MANUFACTURING COMPANY'S GRAPHITE COMPOSITION SEAT WASHER.

PERFECTO Compression Work is the only Compression Work made that is furnished with "GOOD" seat washers.

Having confidence in the Super-excellent qualities of PERFECTO products, the Good Manufacturing Company have entered into this arrangement.

Can you afford to be without PERFECTO Brass Goods?

Galt Brass Company, Ltd.

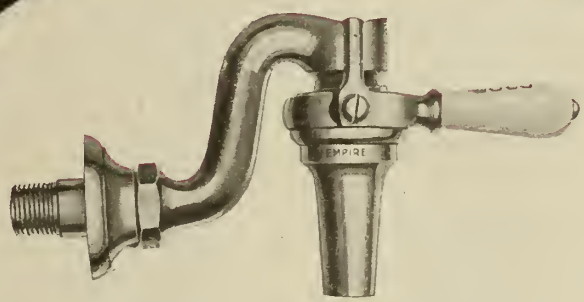
Galt, Canada

SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

Vol. XIII. Publication Office, Toronto, February 1st, 1919 No. 3

"KITCHEN" SINK AND LAUNDRY BIBBS



A 237. Swan Neck China Handle

To provide long service without trouble, to give quick and easy action, to remove all splashing, spreading and spattering there is no faucet equal to the "Kitchener" Packless Quick Opening Bibb.

"Kitchener" Bibbs are made of full-quality red metal, are nicely finished, and will outwear any faucet of like kind.

The installation of "Empire" Products is the one sure way of quickly gaining a reputation for quality work. Every job that you put in with "Empire" goods means the adding of friends to your business list.

Extend your connection and at the same time get your due profit by installing "Empire" Goods.

Empire Manufacturing Company, Limited

London :-: Toronto

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While

A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for **BEAVER BRAND CAST IRON ENAMEL WARE**

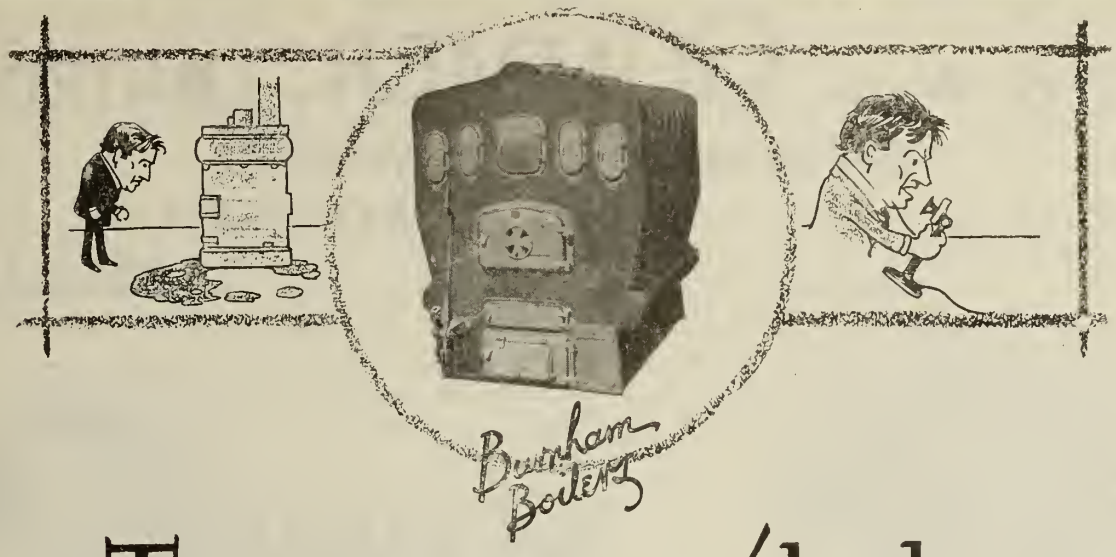
Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

ONTARIO:
Monarch Brass Mfg. Co., 71 Brown St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes, 120 Lombard St., Winnipeg



Temper testing leaks How prevented

BOILERS, like children, have certain tendencies for good and bad.

With boilers one of the most trying is sand-hole leaks. They show up when you least expect them. Generally on carefully chosen zero nights.

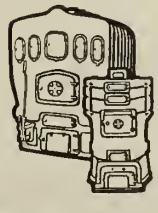
Just before going to bed you take a last look at the fire, and find the boiler giving an imitation of an open faucet.

Punctuated 'phone appeals to the boiler man fail to stir his lethargy. Tells you he'll "be around in the morning." Follows an oil stove siege, waiting for new parts.

We figure that finding leaks is up to us. That's why every Burnham Boiler Section is given an hydraulic pressure test three times higher than it will have to stand in actual use.

We believe it is better business to pay for prevention than to "sell repairs."

Which ends Chat Number Nine, of which there are eight more to follow.



Lord & Burnham Co. Limited of Canada
Boiler (Department)

Manufacturers and Canadian Distributors

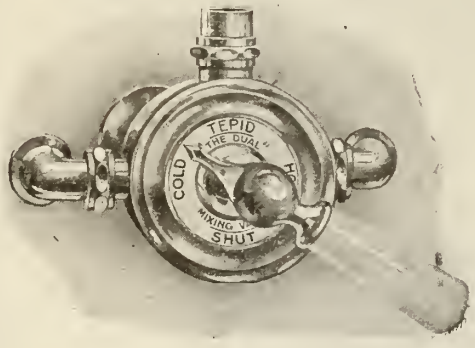
ROYAL BANK BUILDING, TORONTO

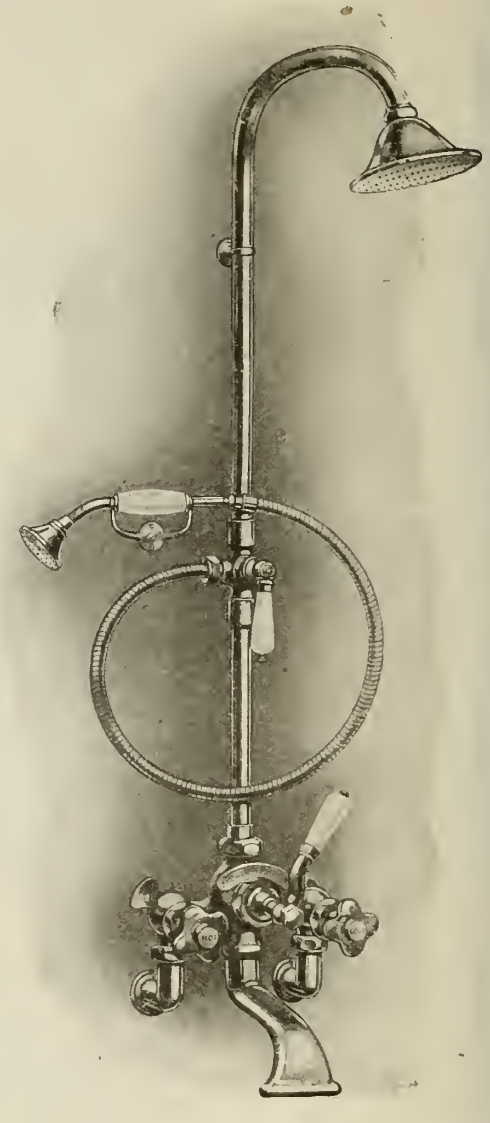
Factory: St. Catharines, Ontario

G. & W. G. GUMMER, LIMITED

EFFINGHAM BRASS WORKS, ROTHERHAM, ENGLAND

And at
9 Fenchurch St.,
London





"Dual" Mixer

A valve that really mixes Hot and Cold Water, and maintains a uniform mixture.

For ease of operation, simple construction and easy installation, it has set a new standard of efficiency.

Cold Water must be turned on first, no possibility of scalding.

Made in several forms for Showers, Sprays, Operating Rooms, etc.

At the well-known works of Messrs. Brunner, Mond & Co. these valves provide baths for 2,500 employees.

G. & W. G. GUMMER, LIMITED

Manufacturers of every description of

Engineers,' Plumbers' and Sanitary Quality Brassware

Advertising That Brings You Business

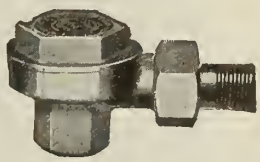
Building has been on the decline for some time, but the tide is turning. You want to be ready for the new business; so do we. That is why we are advertising the excellence of Dunham Heating Service to office and factory owners and home builders everywhere.

This phase of our business cannot fail to interest you, as the advertising which we do makes it easier for you to recommend and install products that have given entire satisfaction for the past fifteen years, and which will continue to do so.

The theme of our argument is the greater satisfaction to be had from a steam heating system equipped with the Dunham Radiator Trap. This little device automatically relieves the radiator of the entrained air and water, thus permitting the steam to give up its heat in the most efficient manner.

The DUNHAM HEATING SERVICE

You will be interested in the full details of the Dunham story. Fifteen years' experience is behind it.



The Dunham Radiator Trap

It comprises a body, a cover and a thermostatic disc which is secured in the cover. There are no loose parts—no sliding contacts—nothing to gum up—nothing to obstruct the valve opening. It is made entirely of bronze and brass. Made with special roughing-in measurements for replacing imitating devices.

C. A. DUNHAM CO., LTD., TORONTO, ONTARIO

HALIFAX MONTREAL OTTAWA WINNIPEG VANCOUVER CALGARY

WE SPECIALIZE IN

PIPE THREADING TOOLS

Take Another Look At This Job

ESTABLISH PEACE

If you desire to establish lasting peace in your shop, you will have to furnish your men with good tools. Men will not do the same amount of work if that work is hard. The more you *INVEST* in tools if they're good tools, the less you will SPEND in labor. To invest is to establish an asset, to spend is to create a liability. Our tools will save you money and make peace in your shop.

ESTABLISH PROFIT

Work made easy becomes a pleasure. Jardine and Toledo Pipe Threading Tools make threading pipe so easy that a boy can thread a 4-inch pipe as easy as he can thread a ½-inch pipe.

Not only so but when a thread is made with one of our tools it's a good thread. No cutting off pieces of pipe. No lost time and no leaks. That's the way to establish a profit on every job.

A. B. JARDINE & COMPANY, LIMITED, HESPELER, ONT.

Sole makers of "Jardine" Pipe-Threading Tools.
Sole licensees to manufacture and sell Toledo Pipe-Threading Tools in Canada.
Agents, Winnipeg and West—Stanley Brock, Ltd., Winnipeg, Man.
Brockville and East—J. R. Devereux, 358 Beaver Hall Square, Montreal.
Belleville and West—W. H. Cunningham & Co., 183 Church St., Toronto, Ont.

OUR MOTTO
QUALITY *plus* SERVICE

We Are Satisfied With

Nothing Short of Perfection

Bathrooms of CHARACTER HELP TO BUILD UP BIGGER BUSINESS

EVERYTHING FOR THE PLUMBER

BATHS, LAVATORIES, SINKS, ARISTOCRAT LAUNDRY TUBS, LEAD PIPE, SOLDER, BLOCK LEAD, SHEET LEAD, Etc.

Confidence Established

There's lasting confidence established when you know that there is a reputation at stake behind the goods you buy, confidence is the safety valve of satisfaction.

We will not sell inferior goods—Our reputation is for quality.

Two Good Rules

We never lose a customer because we have established two rules that are never broken. The other is, "Our products must be right."

Quality plus Service

The Canada Metal Co., Ltd. stands for **Service,** the best possible **Service to its Customers.**

THE ARISTOCRAT TUB IS PERFECT
Equipped with the Aristocrat Wringer Holder

THE CANADA METAL CO., Limited

TORONTO, CANADA

HAMILTON MONTREAL WINNIPEG VANCOUVER

"Standard"
"Perfection" Built-In Baths

Made in One Piece Enamelled All Over

These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners meaning bathroom sanitation.

Made in 5 and 5½ foot sizes.

Illustrations on request.

Write the nearest dealer

Standard Sanitary Mfg. Co.
Limited

General Office and Factory, Royce and Lansdowne Aves., Toronto, Ontario

Toronto Store:
55-59 Richmond Street East

Winnipeg Showrooms:
76 Lombard Street

Hamilton Store:
20-28 Jackson Street West

Montreal:
4 Beaver Hall Square

Calgary:
31 Canada Life Building

Vancouver:
847 Beatty Street

"MADE IN CANADA"

You'd Never Attempt to Run an Automobile Without a Carbureter

THEN WHY INSTAL A STEAM HEATING SYSTEM THAT IS NOT UNDER CONTROL?

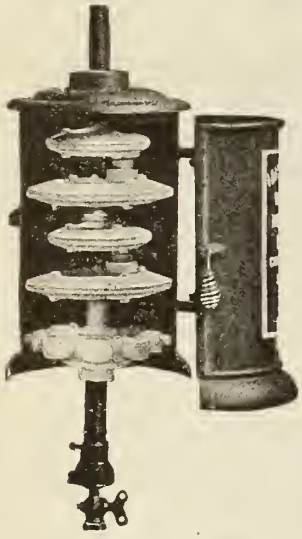
The day is past when a heating system is only made up of pipes, fittings, radiators and boiler. No heating engineer can claim the utmost of efficiency out of every pound of coal consumed in a heating system that is not fitted up with temperature and heat controlling devices any more than he could say he had control of a horse without bits in the mouth and reins.

Not only so, but there's no science in a heating plant not equipped with temperature control and regulation, and thousands of tons of coal are being wasted by poorly installed plants every year.

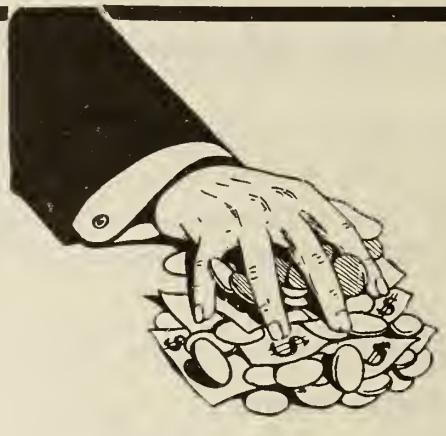
You can make more profits and save coal by consulting us about your next steam job. Write us for literature and watch our advertisements.

Canadian Powers Regulator Company, Ltd.

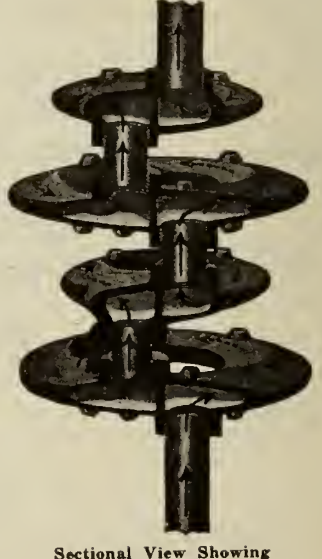
115 Bay St. - Toronto



The Completed Imperial Water Heater



We Put Good Money Within Your Grasp



Sectional View Showing Water Flow

when we put the Imperial Gas Water Heaters on the market. They are undoubtedly the most economical on gas of any other make. They are not only easy on gas, but with the perfect circulation they

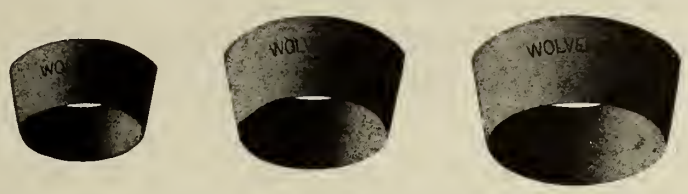
"HEAT WATER IN A JIFFY"

GOODWIN & COMPANY, Limited

Sarnia, Ontario, Canada

Waste Washers
Tank Washers and Spud Washers

made from the Finest Quality Rubber obtainable,
for Lavatories, Baths, Closet Combinations, etc.

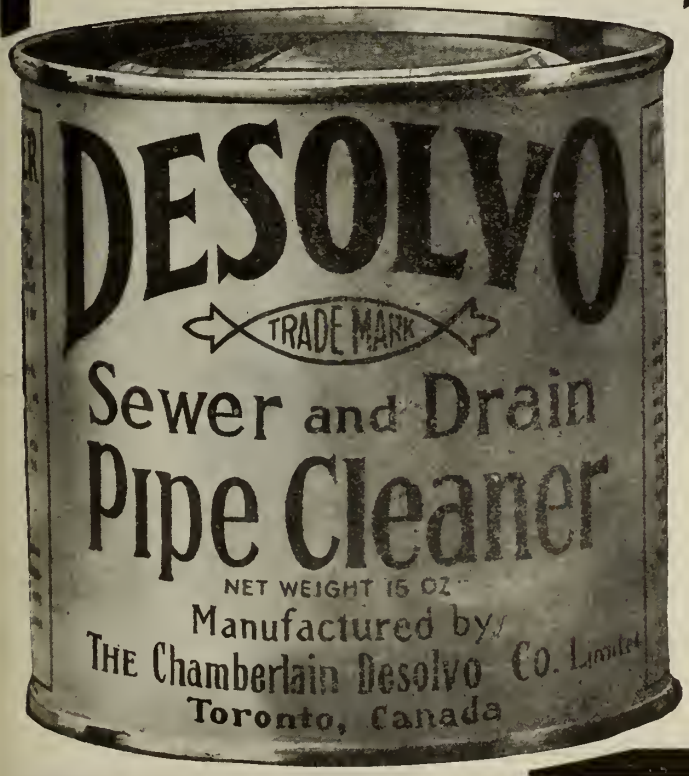


Complete Listings of Styles and Sizes
In Catalog "C"

Write for Late Discounts.

Canadian Wolverine Company, Ltd.
CHATHAM - ONTARIO

DESOLVO IS A WINNER



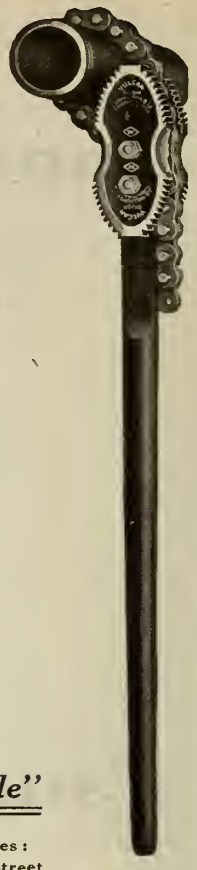
You'll Be Strong For Desolvo—

If you just give it a trial! Desolvo and cold water will clean pipes and drains *quicker* and *cheaper* than you can do it in any other way.

Write out a trial order and mail it to your jobber. You will not regret it.

THE CHAMBERLAIN DESOLVO CO.
LIMITED
110 Church St., Toronto
General Offices - - - PITTSBURG, PA.

Mark of Proof
Is Proof of Quality



There's proved and certified strength in every

WILLIAMS' IMPROVED "VULCAN" CHAIN PIPE WRENCH

Each and every Flat Link Chain is "proof-tested" to two-thirds of its listed catalog strength in a standard testing machine. To each chain so tested is attached the Gray Leaden Seal, illustrated above, and every Flat Link Chain leaving our works *must* bear this seal—the Proof of Quality—as evidence that it has passed our standardized "proof-tests."

Look for this Mark of Proof for its Proof of Quality—it guarantees uninterrupted, severe service as well as safety to the operator. Williams' Wrenches—"Vulcan" and "Agrippa"—are the *only* chain wrenches which offer this certified assurance.

J. H. Williams & Co. *"The Wrench People"*

Western Office and Warehouse
77 South Clinton St.
Chicago, Ill.

THE A. G. LOW CO., LTD.
77 Pacific Ave., Saskatoon, Sask;
Agents for Manitoba, Saskatchewan, Alberta and British Columbia

General Offices:
77 Richards Street
Brooklyn, N.Y.

First Cost *versus* Upkeep Cost!

The purchase price means nothing if the upkeep cost is not low.

The purchase price of King Boilers is no more than the average boiler and yet—

The consumption of fuel—*the upkeep cost* is lower—considerably lower.

The thin, peculiarly shaped waterways in the "King" mean quickly heated water and perfect circulation, which causes a saving in fuel because it obviates the necessity of "extra firing" to move cold water from the radiators.

The Trade should use this quick-heating, fuel-saving argument now while fuel is scarce and high in price.

WRITE US FOR PRICES.

Steel and Radiation, Limited

Head Office, FRASER AVENUE, TORONTO

304 University Street, MONTREAL **101 St. John Street, QUEBEC**

AGENCIES IN ALL LEADING CITIES

Pipe Fittings

Made in Canada

The Brand that has the Quality

M Brand Pipe Fittings, etc., give a service and satisfaction that will invariably get you re-orders and much new business as well.

A trial of the goods will prove this claim.

CAST IRON FITTINGS

With this brand mean fittings made with iron of high tensile strength—proper proportions and correct tappings.

RECESSED DRAINAGE FITTINGS

MALLEABLE FITTINGS

With this brand mean fittings made of Air Furnace Refined Iron, reamed and tapped to gauge with perfect threads.

Standard and Extra Heavy Flanged Fittings and Flanges. Galvanizing Malleable and Gray Iron Castings of all Kinds.

International Malleable Iron Co., Limited, Guelph, Ontario, Canada

Why Jenkins Bros'. Valves are Superior

Fig 106

They are the original renewable Disc Valves. They have more imitators than all other makes of valves combined. They have kept pace with increasing steam pressures and severe working conditions. They are of the simplest design, and can be easily repaired by any man of ordinary intelligence. They are made interchangeable in every part, and any part can be duplicated promptly and inexpensively by the dealer. In the majority of cases they can be repaired by merely changing the disc without the laborious task of regrinding.

Fig. 108

They are recognized as the Standard Steam Valves in all parts of the World, and wherever there are supply houses—Jenkins Bros'. Valves will be found. The Standard of quality never changes except to improve, and while to-day there are hundreds of imitators, the sales of genuine Jenkins Bros'. Valves are constantly increasing.

Catalogue No. 8 sent free on request.

Fig. 114

Fig. 124

HEAD OFFICE AND WORKS:
103 St. Remi St.
Montreal, Canada

JENKINS BROS.
LIMITED

Agencies in all the Principal Countries of the World.

EUROPEAN BRANCH:
6 Great Queen Street
Kingsway, London, W.C. 2
England

PLUMBERS K-T BUILDERS

Trade K-T Mark

GALT Supplies ONT.

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STANDARD

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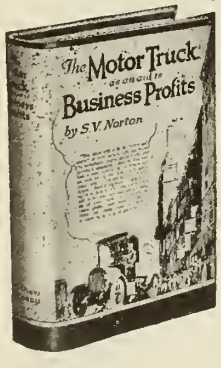

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Chapter V—How to Keep an Effective Record of Costs
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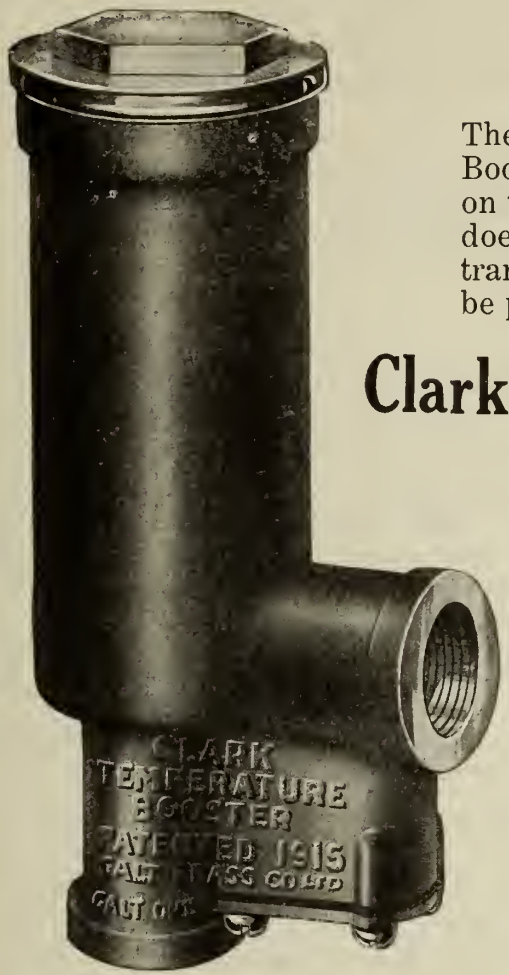

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Easily taken apart and put together again, and every part can be removed without it being disconnected from the system.

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An Agency making a specialty of collecting building statistics reports that in the year 1918, there were buildings erected in Canada for residential, commercial and industrial purposes, to the value of about $97,000,000.00.

The thirty-five cities which issue building permits and make reports, account for about $36,000,000.00 of the same class of buildings in their territory, leaving a balance of $61,000,000.00 to be distributed over Canada in those sections of the country where no records or statistics are kept.

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The PORT HOPE SANITARY MFG. CO., LIMITED, would like to develop this class of work, and assist the Sanitary Engineer or the Plumbers. The policy of the Company is to have its goods installed by the regular Master Plumber, as we know that fixtures properly installed have an added value and give greater service.

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SANITARY ENGINEER

VOL. XIII. FEBRUARY 1, 1919 No. 3

Let Your Light So Shine

The Trade Should Devote More Time to Publicity — Manufacturers, Supply Houses Uses Modern Methods—Show Public the Importance of the Trade to Civilization—What the Profession is Doing and Has Done to Make This World a Better Place to Live in—Come Out of the Dark

By One Of Us

I HAVE been a reader of books on plumbing, on heating, and on all manner of sanitary science. I've read trade journals from every country whose citizens speak the English language; I've read translations from almost every known tongue in connection with plumbing and the plumber, and I've talked with men from France, Spain, Austria, Germany, South Africa, Australia and New Zealand, about the plumber, and they have all told me that they are, as a craft, the most slighted of all men. "A plumber, ye gods!" What a calamity to have to call in a plumber! I remember speaking to an Austrian about the time when he learned the trade in his own country, and then came to Canada. Said he, "I thought somehow that the English-speaking race had more respect for a man who had devoted five to seven years of his life learning a trade so as to be a good mechanic, and in that way be better able to serve those who required his services from time to time." But he found that it was the same in Canada as in Austria; the same in France as in England; in fact the same all over the world.

Now why all this bad feeling? Because without doubt there is a certain amount of suspicion in the minds of the general public towards sanitary and heating engineers (once designated as plumbers and steamfitters).

If the words in the Good Old Book could be counted for much, "By their fruits ye shall know them"—why, sanitary and heating engineers would be real top-notchers. But, as we have not shown the public the "fruit," we must not place all the blame on the general public. As we have not "let our light so shine before men," but have instead "put our light under a bushel," we must look in another direction before we resent any feeling of suspicion which the public have for us as a whole.

We have not shown the public all the power behind such an industry as is followed by us; we have not advertised as we should. For example: How many persons are there who have any idea as to how cast iron enamelware is made? The score and one processes that go to make up a perfect bathtub, a laundry tub, or a lavatory? How many are there who know that there are plants on this continent—more than one—that can turn out upwards of 1,000 bathtubs a day? How many persons are there who realize that in Canada there is a plant manufacturing sanitary and heating engineers' brass goods exclusively, that is the largest of its kind under the British flag? And how many realize that in actual fact a house is practically unfit for human habitation unless equipped with material made by our manufacturers of plumbing and heating supplies, and bear evidence of the work of our hands?

Mr. Reader, have you ever been in a moving picture show and seen pictures appear on the screen describing large ships being built and launched, the interiors of engine shops, views of munition factories, locomotive shops, the process of making panama hats, fountain pens, and the various canning processes, carried out in a score and one factories? Have you not in picture been taken from one end of the world to another? Many no doubt have viewed on the screen the wonders of the Panama Canal. This latter feat was made possible because of the skill of sanitary engineers.

But have you ever seen in screendom pictures the making of lead pipe, wrought iron and steel pipe, or the making of bathtubs, laundry tubs, and lavatories? I venture to say that no picture show has ever described the manufacture of brass goods, of cast iron soil pipe, the manufacture of range boilers, of radiators and boilers. The general public haven't the slightest conception of the great industries that are behind the plumber, the sanitary engineer, and the heating engineer.

Another industry which is very little thought of by the general public, but despite the fact is a wonderful industry, is that of the manufacture of pneumatic water systems. In fact very few of our own trade realize that pumps made for this purpose are of the finest type in the world—second to none. That is the reason why so many concerns who have attempted to make this line of pumps have failed; because they were of the opinion that pumps are all more or less alike. This is not so, however. This pneumatic water system business is in a class by itself, the pneumatic tanks are something different. I know of several boiler shops turning out some of the finest steam boilers in the world which took to making pneumatic water system tanks, but had to give it up. In fact, all through our industry, we, in the sanitary and heating profession, use manufactured products of a high order. Now, why not start something? Why not call upon our manufacturers to have some reputable moving picture film company take a number of reels off, describing their products?

Why not have "our lights so shine before men," and create in the minds of the general public a feeling that we want to serve them even better than we have done in the past, but that we must have their confidence and co-operation? Why not state our case in picture form as well as through the medium of the daily press? Why not co-operate with each other by having well-written articles appear in our home papers? Other industries are following out such plans, why not sanitary and heating engineers?

Here's a little story about a moving picture show. A story was being shown of the foolish things done by a plumber; he was called in to fix a pipe; he made holes all over the plumbing system, but the worst joke of all was where he started the gasoline torch and left the flame flowing forcibly against a lead pipe; the pipe melted and the water from the pipe flowed out in such a stream as to flood the building.

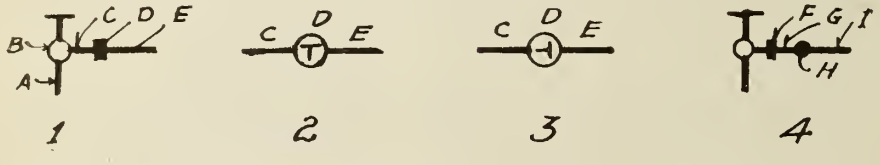
The writer heard a lady declare a plumber had actually done the same thing at her house. Of course the whole film was a low-down foolish lot of jokes on the plumber. But I've often wondered how many persons present ever gave it a thought that a paper bag full of water will not burn; and to melt a lead pipe under pressure of water would be impossible even in a blast furnace. But the point is, the public needs to be shown what is being done by the trade on the one hand, and we, every member of the craft, should endeavor to create a greater confidence. We should pay more attention to the class of men we employ;

encourage them to devote more time to study and to realize that, no matter what we say or do, the public is always right. And after all, are we not ourselves simply members of the general public? Very well, then, we should come out into the open and "let our light so shine."

PROTECTING HEATING PLANTS FROM FROST

By J. E. McCORMICK

DURING the cold winter months the chances of a pipe or valve being burst by frost are remote indeed in those plants which are used entirely for heating dwellings or for heating shops which contain goods or merchandise of such a nature as to become damaged even by slight freezing, but in isolated steam plants (and there are many of them throughout the country), used for mill or factory power, but not for heating dwellings, and which are therefore idle from Saturday noon or night until Monday morning, as well as during fourteen to sixteen hours out of every twenty-four during the week, the engineer must be more or less on guard against damage by frost, especially when the thermometer outside stands at many degrees below zero for a time, as is often the case in many Canadian localities.



There is also more or less chance of frost doing damage in those plants which, in addition to furnishing power, are used for heating shops or factories during working hours, the steam being shut off from the heaters and radiators during nights and Sundays. In such plants I have found the steam lines to be much more liable to damage than the water lines are. The water lines are shorter, and good insulation by means of some kind of covering will do much to protect them and they can generally be so planned that those which must necessarily contain water may, when they do get cold, or nearly so, be warmed up again by opening slightly the necessary valves and allowing water to flow slowly through them from towards the boiler for a little while. This will warm them up and leave them full of hot water again. A slight leakage through the lines, a drop or two per minute if otherwise permissible, will sometimes aid in maintaining the temperature of covered pipes.

But with steam lines it is different. According as the boiler cools down and the pressure goes off, the steam in the lines condenses. Generally a little leakage in the valves allows the most of this condensation to escape, and the remainder freezes in the lines in the form of a shelly ice or of a hoar frost. This is in lines not long enough to require to be trapped. My experience with such plants leads me to believe that except in exceptionally cold weather, covered pipes will not burst with this shell ice, and so long as the boiler is not fired enough at a time to raise any steam, and more especially if the accumulating air pressure caused in the boiler by expansion of the water, while heating, is allowed to escape through the upper gauge cock or other vent while the water is heating, said vent being closed again when the fire has been banked; then the boiler and the water pipes may be kept warm for days without danger of damage to the steam lines. If, however, any steam is raised, it is, in most of these layouts, imperative that enough be raised to thaw out all the steam pipes containing any of the shell ice and that care be taken to see that they are thawed out. I generally find that it is at the valves that the ice seal is most apt to exist and that some hot water poured over the body of these will thaw them enough to open, and this will allow steam to flow, which will soon thaw the intervening pipes. If steam is raised without the lines becoming thawed out before the steam goes off again water will form in the steam pipes and will flow into the spaces in the shell ice already existing and fill these spaces up; then, when this freezes, something is almost certain to burst. Of course if the valves next the boiler were absolutely steam tight no steam could enter the lines to condense them and do damage, but this ideal condition cannot be fully maintained without undue expense for renewal of valves and parts, hence, in general, the principle applies. I have several times known steam lines to suffer damage in this way and had similar experiences myself in plants I had charge of before I learned the real cause and its cure. It is noteworthy that in each of these instances the water lines remained intact.

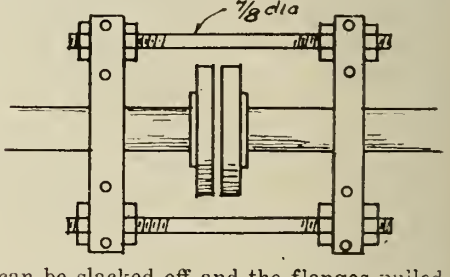
And now for a simple remedy, which obviously does not consist of maintaining a constant steam pressure on the lines, thus involving excessive standby consumption of fuel if kept up during all holidays. The instance sketched is for taking steam direct from the top of the dome or boiler if desired, but the principle can be applied to other positions. In Fig. 1, A is the upright nipple, B is an angle valve, C is another nipple, D is a three-way stop-cock, and E is the continuation of the line. The side outlet of the three-way cock opens to the atmosphere. In operation—during the time the line is in use, the stop-cock is turned to let steam pass directly through it into the line (Fig. 2). When steam is turned off the line by means of the angle valve B, the stop D is turned so as to give a free passage from B to the atmosphere (Fig. 3) and the line is also drained. Now any further escape of steam from the valve B passes out through the side outlet of D into the atmosphere and escapes instead of entering the line to condense and do harm. Any drip from the side outlet of the stop-cock D can be carried away by means of a neat metal trough. Fig. 4 indicates an arrangement calling for more parts but which may be preferred by or be more easily available to some. A, B, and C are as before; F is a tee; D is nipple, H is a globe valve, and I is the continuation of the line. The tee F is supplied with a nipple and a globe valve to provide an escape for leaking steam when B and H are closed. Perhaps quite a number of engineers can benefit as much by the use of this device this winter as I could have benefited years sooner had I known of it and its advantages then.

RENEWING WORN GASKETS IN LARGE FLANGE JOINTS

By S. E. Burd

It is a matter of some difficulty at times to renew joints in large pipe, especially in tight corners where space is limited. As will be seen from the illustration, four pieces of heavy flat iron are shaped to fit around the pipe as shown in the illustration and each pair are clamped on the pipe by ¾ in. bolts. These bolts have 15-16 in. fillers threaded on them so that the ⅞ in. rods will be an easy fit. The ⅞ in. rods are inserted while the fixture is being placed on the pipe and the nuts between the clamps are then screwed up. This forces the flanges apart to the proper distance and the new gasket can then be inserted easily.

After the gasket is in place, if there is no spring in the pipe the inside nuts



can be slacked off and the flanges pulled together again by the outside nuts.

After making this outfit it only takes one man a short time to repair a leaky joint. It can be used for different size pipes by putting packing between clamp and pipe within reason.

CONVENTION DATES DECIDED

The Ontario Society of Domestic Sanitary and Heating Engineers will hold their regular annual convention at the Canadian Foresters Hall, 22 College St., Toronto, on Friday, April 4th. Every member is asked to be on hand, and to keep clear of other engagements on that date. Further particulars will be published in SANITARY ENGINEER from time to time regarding the above event.

Pipe Sizes for Gas Installations

A Practical Schedule For Gas Piping Plans, Endorsed By Expert Gas Men — Sanitary Engineers Will Find This Article of Great Value in Arriving at Proper Pipe Sizes Necessary When Installing Same in Houses For Lighting, Cooking or Industrial Purposes

AT the Canadian Gas Association Convention held last August in Montreal, a number of very important technical problems were dealt with, and considerable discussion took place regarding the relationship between sanitary engineers, plumbers, etc., and gas companies.

It was felt that more co-operation between the two bodies of men would result in greater business and profits for both as well as a great deal better service for the public. One of the technical matters referred also to pipe sizes. Numberless cases were quoted where poorly laid out plans of piping were directly responsible for poor service of the various appliances. It was urged that if plumbers knew a little more about pipe sizes, when installing gas appliances, their customers would get better service from such appliances as are generally used in a home.

In fact several instances were mentioned, even in industrial plants, where the piping installed was too small. As the gas appliance did not appear to be working properly it was condemned, when the real trouble was that piping connected thereto was too small.

The following information, tables etc., are recognized as being based upon the best practices, and in fact these rules are in force in many large American cities.

Piping Schedule

In order to be of definite assistance to architects, engineers, plumbers and others, in the proper piping of all buildings for gas, the *National Commercial Gas Association* advises the use of the following piping schedule, as a conservative and sound basis of practice embodying all standards evolved to date. This schedule is offered by the association for use in all localities where pre-determined conditions do not otherwise obtain. This schedule may be relied upon as fulfilling all requirements of best practice. Gas fitters and contractors will be safe in working under this schedule, which provides equitable conditions for estimating, and insures the owner or occupant an ample supply of gas under safe, economic conditions, whether for illumination, power or heat. It must be understood, however, that the advisory services of the local gas company should be called upon in any territory to go over the schedule with the architect, and it is possible that they may make some suggestions to conform with local regulations or conditions.

Explanation of the Piping Schedule

This schedule is based on the standard formula for the flow of gas through pipes. The friction, and the pressure necessary to overcome the friction, increase with the quantity of gas flowing through; and as the aim of the table is to have the loss in pressure not to exceed 1/10-inch water pressure per thirty feet of length of piping, the size of the pipe increases from an extremity of the system towards the meter, as each section has an increasing number of outlets to supply. The quantity of gas the piping may be called on to deliver is stated in terms of ⅜-inch outlets instead of cubic feet, ⅜-inch outlets being used as a unit instead of burners. The consumption of gas through a ⅜-inch outlet is assumed to be ten cubic feet per hour.

In dwellings, the general practice is to supply gas to the range and water heater by a separate pipe leading from the meter to the kitchen. In case, however, it is desired to supply these or other appliances through the general house piping system, as in apartments or upstairs kitchens, the person planning the piping should apply to the gas company to obtain the value of these appliances in terms of "outlets," for use in determining the proper size of pipe from the schedule.

Directions for Using the Piping Schedule

In using the schedule observe the following rules:

(a) No piping between the meter and the first branch line should be smaller than ¾-inch.

(b) No piping should be smaller than ⅜-inch.

(c) No independent line, in the cellar or on the first floor, from the meter to a gas range should be smaller than one-inch; but when the range is supplied from the house piping, a ¾-inch outlet will suffice. Above the first floor, an independent line from the meter to a gas range on an upper floor should not be smaller than ¾-inch. No pipe laid underground should be smaller than 1¼-inch. No piping extending outside of the main wall of a building should be smaller than ¾-inch.

(d) No ceiling outlet, where the height of ceiling is twenty feet or more, should be smaller than ¾-inch.

SIZE OF PIPE IN INCHES

Required sizes of piping for various lengths and numbers of outlets.

No. of ⅜-in. (or 10 cu. ft.) Outlets.	⅜	½	¾	1	1¼	1½	2	2½	3	4
					Length of Pipe in Feet					
1	20	30	50	70	100	150	200	300	400	600
2	...	27	50	70	100	150	200	300	400	600
3	...	12	50	70	100	150	200	300	400	600
4	...	...	50	70	100	150	200	300	400	600
5	...	...	33	70	100	150	200	300	400	600
6	...	...	24	70	100	150	200	300	400	600
7	...	...	18	70	100	150	200	300	400	600
8	...	...	13	50	100	150	200	300	400	600
9	...	...	...	44	100	150	200	300	400	600
10	...	...	...	35	100	150	200	300	400	600
11	...	...	...	30	90	150	200	300	400	600
12	...	...	...	25	75	150	200	300	400	600
13	...	...	...	21	60	150	200	300	400	600
14	...	...	...	18	53	130	200	300	400	600
15	...	...	...	16	45	115	200	300	400	600
16	...	...	...	14	41	100	200	300	400	600
17	...	...	...	12	36	90	200	300	400	600
18	...	...	...	...	32	80	200	300	400	600
19	...	...	...	...	29	73	200	300	400	600
20	...	...	...	...	27	65	200	300	400	600
21	...	...	...	...	24	58	200	300	400	600
22	...	...	...	...	22	53	200	300	400	600
23	...	...	...	...	20	49	200	300	400	600
24	...	...	...	...	18	45	190	300	400	600
25	...	...	...	...	17	42	175	300	400	600
30	...	...	...	...	12	30	120	300	400	600
35	...	...	...	...	..	22	90	270	400	600
40	...	...	...	...	..	17	70	210	400	600
45	...	...	...	...	..	13	55	165	400	600
50	...	...	...	...	..	..	45	135	330	600
65	...	...	...	...	..	..	27	80	200	600
75	...	...	...	...	..	..	20	60	150	600
100	...	...	...	...	..	..	..	33	80	360
125	...	...	...	...	..	..	..	22	50	230
150	...	...	...	...	..	..	..	15	35	160
175	...	...	...	...	..	..	..	..	28	120
200	...	...	...	...	..	..	..	..	21	90
250	...	...	...	...	..	..	..	..	14	59
300	...	...	...	...	..	..	..	..	..	39
350	...	...	...	...	..	..	..	..	..	29
400	...	...	...	...	..	..	..	..	..	22
500	...	...	...	...	..	..	..	..	..	14

If any outlet is larger than ⅜ inch, it must be counted as more than one in accordance with the schedule below:

Size of outlet in inches	½	¾	1	1¼	1½	2	2½	3	4
Value in ⅜-inch outlets	2	4	7	11	16	28	44	64	112

(e) In determining the sizes of piping, always start at the extremities of the system and work toward the meter.

(f) The lengths of piping to be used in each case are the lengths measured from one branch or point of junction to another, disregarding elbows or turns. Such lengths will be hereafter spoken of as "sections," and are ordinarily of one size of pipe. There are only two reasons for which a change in size of piping will be allowed in a section: First, where the length of a section is greater than the length allowed for the outlets being supplied; as for example, if a section supplying two outlets is thirty-three feet long, twenty-seven feet of this could be ½-inch, and the remaining six feet ¾-inch; second, where the required length from the outlets being supplied will cause a violation of clause "i" unless the size is changed.

(g) If the exact number of outlets under consideration cannot be found in the schedule, take the next larger number. For example, if twenty-seven outlets are required, the next larger number in the schedule, which is thirty, should be taken.

(h) For any given number of outlets, do not use a smaller size pipe than the smallest size in the schedule for that number of outlets. Thus, to supply seventeen outlets, no smaller size pipe than one-inch may be used, no matter how short the section may be.

(i) In any piping plan, in any continuous run from an extremity to the meter, there should not be used a longer length of any size pipe than shown for that size in the line opposite one outlet, as fifty feet for ¾-inch, seventy feet for one inch, etc. Exceptions to this rule are: First, when larger piping than called for by the schedule is run in following "j"; second, when fitter voluntarily runs a larger size than is necessary; as for example, if three outlets are to be supplied by sixty feet of piping, instead of fifty feet of ¾-inch and ten feet of ½-inch being required, the entire sixty feet may be of ¾-inch piping. When two or more successive sections work out to the same size of piping, and their total length or sum exceeds the longest length shown for that size piping, the change in size to a larger pipe should be made as soon as the limiting length has been reached. For example, if five outlets are to be supplied through thirty feet of piping, and then these five and one more, making six in all through twenty-four feet of piping, it would be found by the schedule that five outlets through thirty feet require ¾-inch piping, and that six outlets through twenty-four feet require ¾-inch piping; but as the sum of the two sections (thirty plus twenty-four, equaling fifty-four feet) is four feet longer than the amount of ¾-inch piping that may be used in any continuous run, the twenty-four-foot section must be changed from ¾-inch to 1-inch, four feet from the end of the meter.

(j) Never supply gas from a smaller size pipe to a larger one. If twenty-five outlets are to be supplied through three hundred feet of piping and these twenty-five and five more, making thirty in all, through one hundred feet of piping, it would be found by the schedule that twenty-five outlets through three hundred feet require 2½-inch pipe, and thirty outlets through one hundred feet require 2-inch pipe; but, as under this condition, a 2-inch pipe would be supplying a 2½-inch, the 100-foot section should be made 2½ inches. This does not apply to the case of a small pipe inside of a building supplying one outside of a building, which has been made large as per "c," because it is exposed to outdoor temperatures.

Gas Lighting

Occupants of houses that are fully piped for gas have, at their disposal, a wide variety of burners, artistic fixtures, reading lamps, domes, direct and semi-indirect lighting units. These fixtures are readily and conveniently lighted or extinguished by the pushing of a button or the pulling of a chain.

Apartment Houses

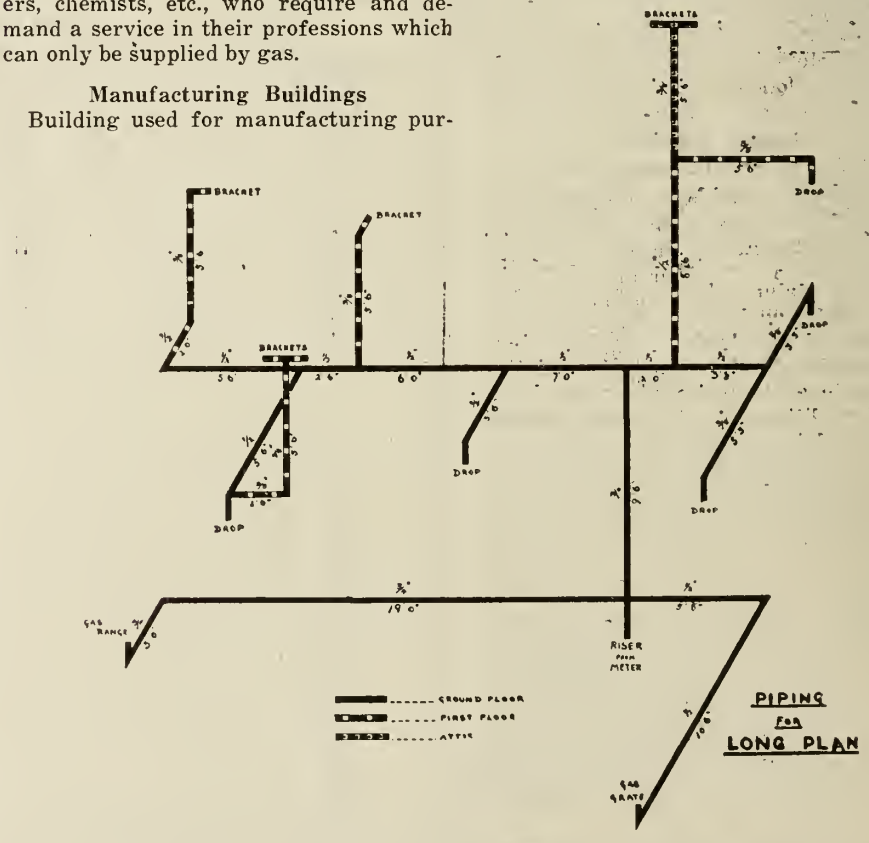
Practically all the uses, shown under the heading of "Residences," apply to each suite of apartments; and in nearly every case "all-gas kitchens" are installed. Incinerators are especially valuable in solving the garbage problem, and should be used.

Office Buildings

Office buildings are no longer exclusively confined to commercial use, but are being occupied more and more by dentists, oculists, barbers, manufacturing jewelers, chemists, etc., who require and demand a service in their professions which can only be supplied by gas.

Manufacturing Buildings

Building used for manufacturing purposes require piping of adequate size to supply the many appliances used in processes requiring heat, such as tailor's irons, singeing appliances, brazing, welding, melting, heating, etc. It is also particularly necessary to completely pipe these buildings for light, for the reason that gaslight is required where color matching is carried on, and in textile trades where the quality of goods must be determined.



School Buildings

Domestic Science Equipment.

Gas Lighting.

Gas water heating for showers in gymnasiums and baths.

Manual training room.

Laboratories.

Restaurant facilities for pupils.

Entertainment facilities for home and school associations.

Other Uses

There are numerous uses for gas in hotels, restaurants, cafes, cafeterias, clubs, churches, hospitals, stores, banks, which should all be considered and provided for in plans and specifications.

An interesting publication, issued by the association, is entitled "The Gas Equipment of the Home," which tells in an interesting way of the use of the gas in its relation to additional comforts in the home, and how, with artistic fixtures, it enhances the beauty of the interior and insures proper lighting.

Flue Connections

Local rules or regulations enter so largely into the matter of flue connections that no general practice may be stated in this respect. The person installing gas appliances should, in each case, communicate with the local gas company in regard to the different sizes and necessities of flues.

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CO-OPERATION NECESSARY

IN this issue there appear a couple of articles which refer to pipe sizes necessary if a good gas service is to be procured from fixtures that are installed. There are big profits to be made from the sale of gas water heaters and gas appliances, and if our readers will peruse the article on page 18, they will note just exactly how the various gas companies view the plumber and sanitary engineer. The article is really that part of a verbatim report which deals with the relationship between certain of our readers and gas companies, and to no small degree with the manufacturers of gas appliances.

Manufacturers of gas, that is, gas companies, are really in business to make and sell gas. That is their only product. Manufacturers of gas appliances are interesting purely and simply in the manufacture and sale of gas appliances. And some of these concerns have several hundreds of thousands of dollars invested in their business. In fact, the gas industry and all its strictly allied trades is one of the most necessary and important industries on this continent, if not in the world. Gas played one of the most important parts in the war, for heat-treating and tempering of shell billets, forgings, material and for tool tempering. To-day gas is absolutely an essential and it is only beginning to come to its own. Very well, then, take that for granted, is it not logical that we, who are so closely related to the gas appliance industry because our class of skill is required to install such appliances, that we should seek to know more about the requirements as to sizes, etc., when piping a house for gas? It was admitted at the Eleventh Annual Convention of the Canadian Gas Association that, as a craft, we were the most logical businessmen to handle gas appliances, but it was also proved, in all fairness, that sanitary and heating engineers had in the first place really forced the hand of gas manufacturers and appliance manufacturers to go over our heads so as to stay in business. This is a straight statement of conditions which should not be allowed to continue. There were many men present representing gas companies from all over the Dominion and the United States who declared that they would be by far the most pleased to see sanitary and heating engineers become better salesmen and better versed in methods of installation and requirements in connection with gas appliances. And with a view of furnishing some information to our readers an article appears on page 15, referring to certain matters in relation to pipe sizes, etc. Several articles will appear in future issues of SANITARY ENGINEER on this subject.

A RADICAL STEP

A SOMEWHAT radical step which is being watched with keen interest by retailers across the line is the Socialistic measure introduced in the legislature of Massachusetts for State insurance. The proposal calls for the appointment of a commission of five competent persons to investigate the matter of State insurance, and to devise a plan whereby the State may issue policies of insurance to the citizens. The commission is to report not later than May 1. People have the money.

THREE BIG FACTORS

ONE of the most important things in connection with business to-day is the sales force. The sales force includes more than your clerks and salespeople. Your show windows and your advertisements, if properly handled, can do just as much for you in quickening turnover, more in many cases than your sales staff can. Every good window display will produce direct results and the same can be said of forceful and timely advertising. An advertisement does not need to occupy a whole page of space to deliver its message. The combined efforts of a well-trained sales force, a well-dressed window and a well-worded advertisement makes a combination that cannot fail to increase business.

IT IS being suggested that the Prince of Wales should get a wife in the States, as the stock of princesses is running short in Europe. Well, why not let the chap get out and hustle and find a wife for himself?

Should Co-operate With Gas Co's

Part of the Proceedings Which Took Place at the Eleventh Annual Convention of the Canadian Gas Association, Held in Montreal Aug. 22 and 23 Last—Sanitary Engineers Can No Doubt Make More Profits by Co-operation With Gas Allied Trades and Companies

ON more than one occasion we have endeavored to secure the co-operation of plumbers in regard to installation by offering to let them carry a stock, we furnishing the appliances to them at cost, and they to do the piping, but in no case was it satisfactory, because there was always someone with no scruple in the matter of the quality of the work, and we would find a half-inch or a three-quarter-inch pipe carried up three or four stories to supply several tenements. Perhaps the stove in the upper part of the building would get good supply, while the others would have very indifferent service.

On another occasion an attempt was made to have all the plumbers take on the sale and installation of gas appliances, but we were told that such a proposition would only be considered on condition that the company discontinued the sales of appliances or the installation of any piping other than the services between the mains and the meters.

Mr. Dains: The appliance man has not a bed of roses by any means. We find that in every community there is always some element of local condition that makes it difficult to do what you want to do.

Take our own local situation. I would like to see someone make a dent into the conditions which we meet with. The Gas Company sells a stove and they send it to the factory, and the wagon delivers it to the door. This is being done in the Dominion of Canada and in the United States. You cannot get every plumber, but if there are five hundred, and you have four hundred, then you have four hundred salesmen on your proposition. One of the advantages of the proposition is that the dealer need not carry any investment in his store.

The Gas Company may say, "We will loan our display so that you have absolute control. Take your order and we will take care of it, and we will do the connecting as well. No plumber has ever refused to accept five dollars when it comes to any offer on the part of the other party.

That is the co-operative plan that I have in mind. A dealer sells only the appliances that the Gas Company sells itself, and he does not go outside. He has to take care of the work, and sell at the Gas Company's price, plus commission.

The consumer may feel that something is being taken away from him, but the Gas Company is doing the work it started out to do—promoting gas sales. Whether they do it with individual men, or with the dealer, I say that it is possible to get departmental stores to do it.

You might not accomplish this in a day. I have been calling on people for ten years, and I have found that it is the "everlasting go to it" that accomplishes the results. You can get 100 per cent. of the dealers the material you advocate. You can sell anything that is useful if you go after the business right.

Mr. Martin: I have been a commercial man all my life. Any business or section of any business that is operated at a loss is fundamentally wrong, and therefore I have always endeavored to sell goods and sell them right. They ought to carry a profit sufficient to cover the anticipated following expenses of operation.

As has been said here, it is a very hard thing to do in the way of upkeep after the sale is made. There should be some means, however, of arriving at an arbitrary figure and add to the cost of the appliance, because it is that particular appliance that gets the benefit of the upkeep.

In the matter of co-operation with dealers I have had fifteen years' experience. We did everything possible to give the dealer the long end of the stick and make him satisfied.

We found that the minute you suggest to a dealer that he sell the same type of appliances that you are selling, under the same name, the dealer at once realizes that he has no individuality. He is merely a tool of the gas company.

That is practically what you aim to do, anyway. The dealer wants that individuality; he wants a different appliance to sell. His ideas and knowledge of those appliances is very limited. He takes the salesman's talk as to what the appliance is and what it will do.

Well, now, a lot of these salesmen are good fellows, and they go and sell a dealer something that he ought to get—something that he can sell at a great deal less than the gas company's appliance, and he will sell as much as he can, but to get him to sell your appliance with your name on it is to make him lose his individuality, and he is accused of being a tool of the gas company.

We have never been successful in having this so-called co-operation through either a plumber or departmental store or any class of merchandising institution.

Mr. Elcock: Three years ago we tried a co-operative plan with the plumbers. We supplied them with sample ranges, show cards, advertising data, and allowed them a margin of profit. They were to retain the samples. They booked the orders and supplied us with the contracts, and we filled the orders.

Our experience in that case has been very disappointing. The numbers sold were comparatively small, and I do not quite agree with what the last speaker said, that the majority of the public thought the plumbers were working hand in hand with the gas company. I know our results were very disappointing.

Mr. McIntyre: It seems to me, after all that has been said this morning, that the feeling of the general public towards the service is a sort of suspicious one on the part of the consumer. Now, that should not be. If the gas company can get the public to buy appliances from it, and give the public satisfactory service, and have a satisfied consumer, he is a good asset for any public service commission. And it is the same thing with the plumbers.

If you get the plumbers and dealers to work with the company, and the consumer gets a better service by buying the same appliance from the plumber, I do not see why anybody should look with suspicion upon the plumber.

Mr. Gerry: Following upon Mr. Martin's remarks we tried several times to have the plumbers handle our appliances on a commission basis, and it proved that the sales were very small.

Since that time our endeavors have been along the lines of having them handle a good grade of appliance and to make proper installations, and it has been far more successful.

Mr. Newsome: I do not know that I really have any license to speak to this audience, but I have heard a few rather uncomplimentary remarks about the plumber.

I represent the plumbing trade. It seems to me that all that is wrong with the plumber is that he is not yet a merchant. Don't you think that if the gas people—the manufacturer of gas stoves and appliances, and gas companies as well, did a little towards telling the plumber that he is not a merchant—tell him that he must become a salesman, you will accomplish quite a lot?

I met one individual a few years ago in Toronto and I said to him, "Why don't you go into the gas water heating business?" He said, "I cannot do it." I said, "Why?" He said, "It is because of the fact that the gas company can undersell me and does every time. If I sold at their price there would be nothing left for me, considering the few I sell in a year."

I asked him, "How many do you sell in a year?" He answered, "Two or three." I replied by telling him that that was not even attempting to sell gas water heaters. "Why don't you get right down to business, use your store window, make a display of gas appliances and sell

enough to reduce your overhead expenses?" He did so, and after that the young fellow sold twenty-two gas water heaters in six weeks.

We are told that they should not buy appliances that will not give good service. On the street I live on I met a man who told me that he had a gas hot water heater in the house. He told me that he bought it two years ago and it was no good.

I said, "Why didn't you buy a good one? You did not go to the gas company for it?" He said, "No, I bought it down at ———" (naming a departmental store). And naturally I told him he should have bought one from either the gas company or a reliable plumber, but he complains that their prices were too high, etc.

The plumbing trade cannot afford to sell cheap goods, and they have that same object in view, viz., service behind each sale. I think the gas companies should try to educate the plumber and make him more of a salesman.

I was particularly pleased with the remarks of one of our friends (I think it was Mr. McIntyre), when he said that it seemed strange that the plumber did not pull with the gas companies. It seems to me that they can be made to pull if they are educated. I would not take a ten dollar bill if I did not earn it, and I think a plumber who did so should not be in business.

If the plumbers became merchants they would lower their overhead expense, and I think we should all co-operate by trying to get them to become merchants, and I am sure if I can get any member of the Gas Association to help me in any way, by writing articles suitable for SANITARY ENGINEER, our paper is ready to do all it can. It is at your disposal.

Regarding the question of cheap goods and installing of same, I will relate what happened just recently. One of our readers phoned me and said he was glad that he had taken the advice of SANITARY ENGINEER regarding the question of selling rubber hose for connecting a two-ring gas plate. A customer of his wanted to buy a rubber hose for that purpose and he suggested connecting it up with iron. But when the customer learned that it would cost $2.75, the customer (a lady) replied that she would go to ——— and buy a rubber hose. She did and is now in her grave. She was the person who was reported as having died from gas poisoning; the rubber hose had begun to leak, etc. My friend the plumber vowed then that cheap gas appliances or anything of a temporary nature would play no part in his business so far as gas appliances were concerned.

Mr. Wallace: One of the difficulties to bring about co-operation with plumbers is the lack of knowledge and the indifference on the part of the average plumber as to the requirements for the proper installation and adjustment of gas consuming appliances. We would have to start and educate the whole plumbing fraternity as to what is required, and I feel we should just as well do that in our shops. Any difficulty that the plumber has is invariably referred back to the gas company.

Mr. Dains: Mr. Wallace just struck the nail on the head. You have to do it, anyhow. Why not get co-operation started? I had an experience when I drove twelve miles to see a plumber who took an order away from me. I went twelve miles out of my way and I received a setback. The plumber told me, "I have forgotten more about that appliance than you ever knew." I said, "Thank you. If you need me send for me."

Three weeks later I got a telephone message to "please send another heater to this point." I did not ship it.

He paid thirty dollars for his experience, and I said, "Mr. Plumber, I could give you this without any cost, but I am going to charge you thirty dollars because you knew it all."

Mr. Johnson: In regard to service, and whether it should be charged directly to the sale, I think that a certain part of it should be, but it is something that each company will have to determine for itself, what part should be charged to commercial or new business department.

In regard to industrial appliances, the amount of profit varies, and I do not think you can fix a certain amount of profit in that case. I do not believe that you should put a great amount of profit on industrial appliances, but I also do not believe in selling at less than cost. You should get a small profit out of them, but take all the lines that you handle, and the percentage of profit varies, and it is the same with all merchandise. There is one thing we should try to remedy, but I believe you find it more in the electric than you do in the gas business, and that is the low re-sale price set by the manufacturer. Of course with the gas business there is comparatively little of it.

In regard to the co-operation of the departmental stores, we have found that they are the hardest people to control in the line of prices. It is not only in gas lines, it is in all lines. There are certain departmental stores that some manufacturers will absolutely refuse to sell for the reason that they will state they will re-sell at a certain price or higher, but they will cut the bottom right out. There are a lot of such stores today who will do the same with gas stoves, and who will not live up to any agreement as to the sale price of gas ranges.

In regard to the co-operation of the plumber, we worked on that line several years ago, but were never satisfied. We are situated differently from most of the companies on account of the size of the city so have opened up branch stores, and are very much in favor of them. They are working out much better than by co-operating with the plumbers.

I believe in co-operating with the plumber in every way, providing satisfactory working agreements can be arranged.

One thing that has not been brought out, which I would like to see taken up, is that in regard to the neutral line of goods that gas companies can handle. It is really surprising how that will help to pay the expenses of your sales department. It is something that takes up very little of your floor space or capital investment. The profit is fair, and interests the women. We have cases where they come in to buy a small aluminum dish or kettle for $1.39, and before they went out we would sell them a range to go with it.

The President: I want to thank Mr. Johnson for his paper because it has brought about a most interesting discussion.

Now, our next paper is one prepared by Mr. E. H. Caughell, manager of the St. Thomas Light, Heat and Power Department, St. Thomas, Ont., entitled, "Standardization and Inspection of Piping Installations." Mr. Caughell has been called away, and I would like to have Mr. McIntyre read this paper.

(Mr. McIntyre reads paper.)

(See page 23, September 2nd issue.)

The President: We are open for discussion, gentlemen.

Mr. Wallace: Mr. Caughell in his paper has, I think, revived some points of ancient history.

There was a time when the gas companies had an established rule for the installation of piping, and some of them maintained a pretty rigid attitude as to what they would or would not do. I remember that no meter would be connected unless the piping had been inspected by a company representative, and the consumer would have to wait for a supply of gas until these specified conditions had been complied with.

Competition forced us to recede somewhat from that attitude, and the desire to secure new business or hold what we had, is in part to blame for the present situation. The old time standards would hardly apply to-day, and the suggestion brought out by Mr. Caughell is one that ought to be given every consideration.

Mr. Dion: If in the opinion of the gas managers such a regulation is necessary, it is evident that it should be general, and that each company should not have a specification of its own. Whether we think so or not, it seems to me that it is a matter of time only before such regulations will be enacted by the municipalities just as they have done with regard to buildings, plumbing, etc. In fact, I understand there is a move on in a quiet way to induce the cities to pass such legislation.

Now, if this is done it may be done in a way that we would not like. Men who are competent to advise in the matter may not be the ones chosen. It may be left to architects, many of whom have not given very much study to that part of building construction and conditions, and regulations may be put on the books which will be unsatisfactory to the gas companies.

Following the line laid down by other associations, it would seem to me, if it is the opinion of the managers here that such regulations are desirable, that we should anticipate such regulations on the part of the municipalities, because they could not get anything better and more

practical than those emanating from this association.

It just occurred to me that it might be a good thing for the chair to appoint a committee to consider the matter during recess, and bring in some report at the next meeting of this association.

Mr. McIntyre: The executive took that matter up at a meeting not very long ago. Mr. Allen can give you any information that you desire, but the only feasible way to have a standard installation would be to have it come through this association.

The city council at Kitchener two years ago drafted a by-law in regard to gas piping, and the inspection was going to be made by the building inspector, but the reason the by-law was not finally passed was because they could not get a really standardized rule covering every case, at least at that time. I think if the matter was taken up by this association and the rules adopted by the association, there is no doubt that every gas manager could get the city to pass a by-law.

Mr. Forstall: It might be a help to the secretary to look over a book of that type which the A. G. I. published some time ago.

Mr. Allen: I might mention that at the last executive meeting I brought up the question regarding gas piping specifications. Mr. Stotz, of the National Commercial Gas Association, wrote me stating that he thought that the Canadian Gas Association ought to co-operate with the N. C. G. A. He said it had gone to the expense of having four pages of specifications inserted in Sweet's catalogue, an architectural specification book published in the United States, but it felt that it could not extend the work into Canadian territory, thinking it was our duty as a Canadian Association to interest our own people.

There was a representative of the Canadian Specification Data Company, Limited, at that executive meeting, who was ready to give his ideas as to what he was ready to do for the Canadian gas men in the way of interesting the Canadian architect and builder in gas piping and appliance specification data. He said his company was willing to copy the American gas specifications.

His charge was rather high for such service, so a recommendation was brought in that the secretary get a price on what the four pages would cost in booklet form, and have them mailed to the architects of Canada. This booklet would show the architect the specifications as adopted by, not only the American Gas Association, but also by the Canadian Association, and ask them to follow these specifications as far as they were able to do.

Mr. Hewitt: They are copyrighted by the American Gas Association, but I have no doubt we could get their permission to reproduce them in booklet form. I think they are the best extant. They are the best in the country.

Mr. Forstall: I think the specifications referred to were gotten up by the American Gas Institute and the National Commercial, and they are largely along the line that was adopted by this Bureau of Standards to establish a gas safety code which was to embrace every feature of the business of supplying gas as it related to the consumers. One section of the safety code was practically complete when the Bureau of Standards got so very busy on war matters. There is nothing being done with it at all now and will not be done until the war is over. After that I suppose it will be taken up again, and when it is drawn up by the Bureau of Standards I think it will be found that the Bureau of Standards are willing to accept the advice of the gas men as long as they are not detrimental to the consumer, and it will represent the best advice on the subject of house piping and appliance connection that is to be had in the United States, and ought to be worthy of adoption pretty well all over the Continent.

Mr. Grace: With our gas inspection department taking the same attitude as the Bureau of Standards, might not the Canadian Gas Association make strong representations to have them institute regular proper specifications, and in that way you would have federal control at the suggestion of the gas men. They have on one or two occasions changed the standards to suit the conditions. I think they would do the same in the matter of controlling specifications and piping.

Mr. Dion: I quite agree that the American specifications mentioned are probably the best we could get, and when the war is over and the Bureau of Standards finally adopts them, we could most likely adopt them ourselves, but I want to anticipate any action on the part of municipalities which might bring in specifications unsatisfactory to the gas company.

Is it not possible that a committee of this association could take the specifications of the Bureau of Standards as far as they have gone? I understand as far as piping is concerned it is almost complete, and we could formulate a code which we would have ready for action in case a municipality proposed something else, without our waiting for final action.

What would be the result if a town or city council were to adopt a code which was detrimental to the interests of the gas company? The manager of the local gas company may have a code satisfactory to them and he would be most likely to get them to accept it. It would show the council the authority behind the code.

I suggest that the association as such should have ammunition of that kind ready for any conflict that may arise, and it occurred to me that a committee composed of men best able to handle this thing might be nominated at this meeting, and keep the question before them, and if occasion arose they could take action.

Mr. Byrnes: We are forced to establish a hard, firm, set rule as to the size of piping, and we met a great deal of opposition from the plumbers. We tried our very best to have the municipality appoint an inspector, and we have tried everything along the lines that Mr. Forstall mentioned, as to what the size of the pipe should be. I have these now in pamphlet form, and will be glad to send copies to anyone interested. We found in our experience that any deviation from that line in the size of pipe will get the gas company and consumer into trouble, regardless of what the plumber says or does.

The President: We have with us Mr. Newsome, editor of the SANITARY ENGINEER, who has something to say to us on this question.

Mr. Newsome: This subject is very interesting to me indeed. I have been advocating the adoption of a gas by-law for the last five years. A few days ago I met a member of the Toronto Society of Sanitary Engineers, and he said to me, "I understand you are going to attend the Gas Association convention." He told me that the trade did not know anything about the size of piping.

I tell you what we will do. We will undertake to publish every practical article that any member of this association will furnish us for publication in the SANITARY ENGINEER, free. We will publish them word for word, and will hold the type and we will give your secretary a price on reprinting same in booklet form. You shall not be charged one cent more than the cost. We know that such articles as would come from the pen of you gentlemen would be interesting as well as educative, and every reader of SANITARY ENGINEER would greatly benefit by reading such articles.

We will also publish editorial articles written for the purpose of pointing out that there must be more co-operation between gas companies and plumbers, and that the benefit would be mutual. If SANITARY ENGINEER can serve the gas associations or gas companies it is right here to do it at no cost, because we know the plumbers want the information which can best be procured from you. If I could find out the man who put in a one-eighth inch pipe to an appliance consuming sixty feet of gas per hour, I would tell him that he should not be in the plumbing business.

We will do anything we can to help you out, and it is up to you. If I do not get some information from you people that will help improve relationship between gas companies and plumbers I am going to write and tell you that you are a lot of slackers. (Laughter.)

Mr. Wallace: In connection with my former remarks as to the knowledge of the plumber of the proper requirements in the connecting and adjustment of gas appliances, it is perhaps only fair to say that in the particular case mentioned the fitter, not having experience in that line, was misled by the size of the delivery orifice which was furnished with the appliance, and had assumed that because the nozzle was of small diameter that a small pipe would be ample; on finding that he could not keep the flame from flashing back he removed the air mixer altogether and connected the gas pipe direct with the burner.

Continued on page 21

New Canadian Patents

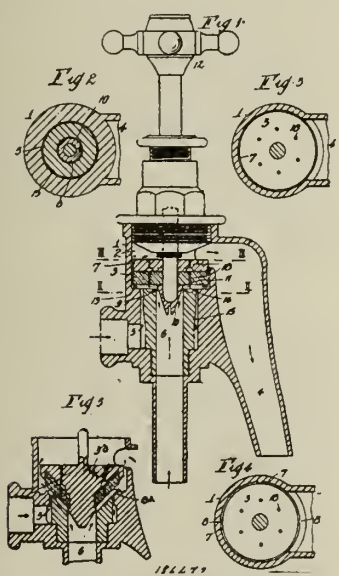
No. 186,472

Peter Stewart Hanton, Kew, Victoria, Australia, 10th September, 1918; 6 years. Filed 18th September, 1917. Receipt No. 285,406.

Claim.—1. In steam heated water supply systems, valvular means whereby independent supplies of water and steam are approximately simultaneously admitted into a mixing chamber, and means whereby the fluids are caused to flow together in a thin film from the independent sources to the mixing chamber.

2. A mixing valve for steam and water comprising a valve casing having a seat therein defined by a circular wall, steam and water supply conduits opening on the base of said seat, a circular valve of slightly less diameter than said circular wall arranged in said seat and forming with said wall a narrow annular passage, and means for moving said valve vertically to control the flow of fluids from said conduits.

3. A mixing valve for steam and water comprising a valve casing having a circular seat therein defined by an upstanding circular wall, a steam supply conduit opening centrally on the base of said seat, a water supply conduit surrounding said steam supply conduit and opening on the base of said seat, a circular valve of slightly less diameter than said wall arranged in said seat and



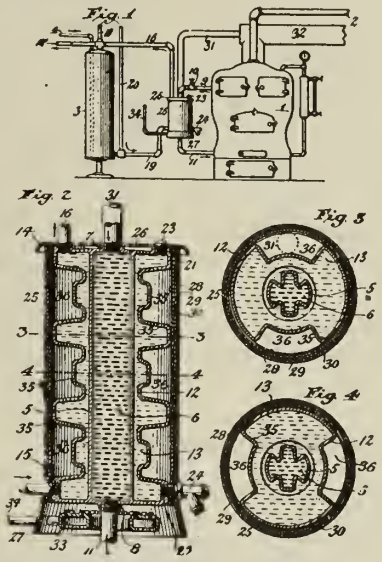
186,472. Mixing Valve for Steam Heated Water Supply Systems.

forming with said wall a narrow annular passage through which the mixture of steam and water passes, and means for moving said valve vertically to control the flow of fluids from said conduits, said valve when raised being disposed within said wall, whereby the fluids pass through the annular passage in a thin film.

No. 185,416

Calvin Page Wadley, Buffalo, New York, U.S.A., 9th July, 1918; 6 years. Filed 3rd April, 1918. Receipt No. 293,034.

Claim.—1. A water heater comprising an inner heating chamber adapted to be connected with the water space of a boiler, an outer heating chamber surrounding said inner chamber and adapted to be connected with the fixtures which are to be supplied with hot water, and a burner arranged to deliver a flame against said outer chamber.



No. 185,416. Water Heater.

2. A water heater comprising an inner heating chamber adapted to be connected with the water space of a boiler, an outer heating chamber surrounding said inner chamber and adapted to be connected with the fixtures which are to be supplied with hot water, a burner arranged to deliver a flame against said outer chamber, and a casing enclosing said chamber and burner.

3. A water heater comprising an inner heating chamber adapted to be connected with the water space of a boiler, an outer heating chamber surrounding said inner chamber and adapted to be connected with the fixtures which are to be supplied with hot water, a burner arranged to deliver a flame against said outer chamber, and a casing enclosing said chambers and burner, and provided at its lower end with an inlet for air and an inlet at its upper end for the escape of products of combustion.

4. A water heater comprising an inner heating chamber adapted to be connected with the water space of a boiler, an outer heating chamber surrounding said inner chamber and adapted to be connected with the fixtures which are to be supplied with hot water, a burner arranged to deliver a flame against said outer chamber, and a casing enclosing said chambers and burner, and provided at its lower end with an inlet for air and an outlet at its upper end for the escape of products of combustion, said outlet chamber having its wall constructed of a plurality of transversely elongated or oval sections, each of which is arranged with its narrow ends closed to the body of said casing while the opposite sides thereof are separated by intervening passages from said body and the several sections being arranged so that the narrow ends of one section are vertically in line with the passages between the casing body and the wide sides of adjacent sections.

SHOULD CO-OPERATE WITH GAS CO.'S

Continued from page 20

Mr. Grace's suggestions as to the matter of regulation, and Mr. Hewitt's comments as to the impossibility of bringing that about, might be overcome if the association would establish a line of standards and then submit them to the Public Utilities Commissions. I know from experience that our provincial Public Utilities Commissions are prepared to recognize and appreciate any suggestion that the association will make for the protection of the gas consuming public.

Mr. Martin: I do not see why you should fear any antagonism from municipal corporations. We do not have any difficulty in that direction. Of course we benefit by the experience and intelligence of the men connected with the United Gas Improvement Company, who furnish us with a small booklet which we in turn distribute to the architect. We see him personally and explain what we are trying to do. We give each plumber in the town one of them, and explain anything he wants to know to him. We have difficulties at times, due not so much to the master plumber as to the operator. We furnish him with that book, and the architect puts a clause in the specification, "The house piping must be put in according to the rules and regulations of the Des Moines Gas Company."

Our inspector comes around to the house, and if he finds that the specifications have not been followed out he refuses to set a meter until the line is made a proper size.

We had no difficulty whatever with our municipal authorities. They do not know anything about it. They have to take your word for it. Their interest is only to know that the consumer or public is going to get satisfactory service.

Market Conditions and Tendencies

Statements Regarding Supplies and Trend of Prices

THE MARKETS AT A GLANCE

PIPE fittings have come in for a further revision downward this week, and new prices named provide for quite a substantial reduction from previous levels. Wrought pipe shows no further change from that noted last week.

After two or three weeks of uncertainty as regards decline to be made, new prices have finally been determined upon for boiler tubes. These show a general decline of about 10 per cent. This is not the result of an accumulation of supplies, for although shipments are coming along better there are still some sizes not represented on the stock sheet. The past few weeks have seen a heavy demand for tubes, and offerings have been quickly absorbed to keep stocks at a low point.

Further declines have been recorded in jobbers' prices of both galvanized and black sheets. The former have come down 80c per 100 pounds, and the black are down from 50c to 80c. It is indicated that basis now established is right in line with figures at the mills, and no further recessions from quotations adopted are expected unless the mills undertake a further revision in their prices. The tonnage coming to hand is considered very good.

Ingot metals show a general revision downward, copper, tin, lead, spelter and antimony all being affected. Dealers feel that the bottom has been reached for the present. Solder is also down, but no further change in manufactured lead products is reported, though lead traps and bends reveal a weaker tendency.

Range boilers have not been changed, but the feeling prevails that a lower basis will be established before long. Enamelware generally is firm, though some slight revisions in pints have been made. Cotton waste seems due for a slight decline, probably 1c to 2c per pound, according to grade. Oakum is unchanged.

TORONTO, January, 29—Pipe fittings have been revised to lower levels, taking effect February 1. Some slight changes in roll rim and flat rim sinks are also noted. Solder is lower and declines have been general in ingot metals. The feeling is general that bottom has been reached on metal for the present and the trade is keen after business to-day.

Easier Feeling In Range Boilers

RANGE BOILERS—An easier feeling is reported in range boilers, although no price revisions have yet been made. The feeling prevails that lower prices must be named and that declines will be recorded in the near future seems probable.

	Standard	Extra Heavy
30-gallon range boilers	$14.00	$17.00
35-gallon	17.00	20.50
40-gallon	20.50	24.00
52-gallon	28.00	32.00
66-gallon	37.00	42.00
82-gallon	45.00	50.00
100-gallon	62.00	70.00

Prices on Sinks Show Revision

ENAMELWARE—Prices on sinks have been revised, the roll rim being down slightly, whereas flat rim are up a little bit. Quotations now being named to the trade on the roll rim are: 16 x 24-in., $12.00 each; 18 x 24-in., $12.30; 18 x 30-in., $15.05; 20 x 30-in., $16.15. The flat rim are quoted for the 16 x 24-in. at $16.00 each; 18 x 24-in., $16.20; 18x30-in., $15.05 and 20 x 30-in., $16.15. Other lines of enamelware show no change and the market is holding very steadily. Labor is the main factor in the cost and on the present scale of wages no material change in prices of the manufactured product is looked for.

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Basins, flat back, 11 x 15 in.	6 00
Do., corner, 15 in.	5 95
Sinks, roll rim, 18 x 30 in.	15 05
Closets, oak tank and seat	27 00
Do., enamel iron or white vitro tank	29 00

Pipe Fittings Down; Soil Pipe Holds

SOIL PIPE, FITTINGS — A general revision in pipe fittings, both malleable and cast, effective February 1, has been made and quotations now being made to the trade are: cast iron fittings, 12½ %; plugs, 22%; bushings, 28%. Standard unions are unchanged at 35%. Malleable fittings, class A, black are lower at 53c per pound; class A, galvanized, at 66c; class B, black, at 24c; class B, galvanized, at 33c; class C, black, at 16c and class C, galvanized, at 24c.

No change has been noted in soil pipe and fittings: the market holding quite steadily at unchanged figures. Quotations range at following levels:

SOIL PIPE AND FITTINGS

Medium and extra heavy soil pipe, 2 in. to 6 in.	15%
Medium and extra heavy fittings, 2 in. to 6 in.	25%
8 in. soil pipe and fittings	Net list

C. I. PIPE FITTINGS

Cast iron fittings	12½%
Plugs	22%
Bushings	28%
Unions, standard	35%
Dart unions, ¼-inch to 2-inch	15%
Do., 2½ in. and larger	6½%
Nipples, up to 4-inch	45%
Do., 4½-inch and larger	40%
Do., running thread 4-in. and under	25%
Couplings, 4-in. and under	35%
Do., 4½ in. and larger	15%

MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittings, Class A, lb.	0 53	0 66
Do., Class B, lb. net	0 24	0 33
Do., Class C, lb. net	0 16	0 24

Valves Hold At Unchanged Levels

VALVES—No material change in the situation on valves is reported. There is little buying interest just at present and a revision to slightly lower levels may, it is indicated, develop at an early date. In the meantime quotations hold at following figures:

	Discount off list
Ground work	40
Compression work, standard	45
High grade	41
Cushion work	40
Fuller work, standard	43
High grade	36
Basin cocks, No. 0 standard	38
Nos. 1 and 2	38
Bath cocks	48
Flatway stop and waste cock, standard	45
High Grade	45
Roundway stop and waste cocks, standard	45
High Grade	45
Brass steam cocks, standard, add 10%.	
Globe, angle and check valves, standard.	Net
Do., removable sear	Add 5%
Radiator valves, standard	10
Do., removable seat	Net List

Patent quick opening valves	30
Basin Cocks—	
No. 0 and 1, Fuller pattern	43
Globe, angle and check valves, standard, medium pressure	10
Radiator valves, standard med. pressure.	30
Radiator valves, removable seat, medium pressure	25

Waste To Go Lower; Oakum Holds

WASTE, OAKUM—No price revisions have yet been recorded in waste, but indications point to declines of from 1c to 2c per pound according to grades. Some expect new prices at an early date, whereas. others look for present basis to be maintained for another month or six weeks. Lower prices may be said to be on their way at any rate.

Oakum remains at unchanged levels. Some shading of prices on plumbers' is reported, but this does not seem to be general, $10.00 being price most often heard. Prices ruling are shown herewith:

	Per 100 lbs.
Best American	$21 00-$22 00
Clipper, spun	-21 00
Do., unspun	-10 50
Plumbers', spun	10 00-10 50

Wrought Pipe Prices Holding

WROUGHT PIPE—Wrought pipe reveals no further price changes from those noted last issue and the trade generally has settled down to the new basis and is now keen on developing new business. The present scale of prices appears in panel herewith:

WROUGHT PIPE
Price List No. 38—January 6, 1919.
Standard Buttweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
⅛ in.	$6 00	$ 8 00	$	$ ....
¼ in.	4 68	6 81	5 28	7 41
⅜ in.	4 68	6 81	5 28	7 41
½ in.	6 21	7 78	7 06	8 63
¾ in.	7 82	9 95	8 97	11 10
1 in.	11 56	14 71	13 26	16 41
1¼ in.	15 64	19 90	17 94	22 20
1½ in.	18 70	23 76	21 45	26 54
2 in.	25 16	32 01	28 86	35 20
2½ in.	40 37	51 19	.....	.....
3 in.	52 79	66 94	.....	.....
3½ in.	67 16	84 18	.....	.....
4 in.	79 57	99 74	.....	.....

Standard Lapweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
2 in.	$28 86	$35 34	$32 56	$39 03
2½ in.	42 12	52 36	47 97	58 21
3 in.	55 08	68 47	62 73	76 12
3½ in.	69 00	86 94	78 20	96 14
4 in.	81 75	103 00	92 65	113 90
4½ in.	93 00	118 00	112 00	137 00
5 in.	108 00	137 00	130 00	159 00
6 in.	140 00	178 00	169 00	206 00
7 in.	183 00	232 00	219 00	268 00
8L in.	193 00	244 00	230 00	281 00
8 in.	222 00	281 00	265 00	324 00
9 in.	266 00	336 00	.....	.....
10L in.	246 00	312 00	294 00	360 00
10 in.	317 00	402 00	379 00	464 00

Terms, 2% 30 days, approved credit.
Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Boiler Tubes Register Decline

BOILER TUBES. — Reductions have taken place in the price of tubes and these appear to be voluntary on the part of some of the sellers. There are no large stocks on hand either here or across the line. In fact there are some sizes that are not represented yet. There has been for some weeks past an unusually heavy demand for tubes, and this tends to keep the stock on hand at a low mark. Instead of the old tube list standing with ten per cent. off a new list was handed out a few days ago, making 2-inch lapweld tubes $32 per 100 feet against a former $36. It may be that still lower prices will come in tubes, for they are still a long way ahead of the pre-war prices, but these will, it is thought, come along gradually. It is doubtful if even after the lapse of time and much readjusting prices will ever come down to pre-war levels. By November of 1915 the price had shown only a nominal advance. After that the rise in price amounted to a real procession, and it was an unbroken succession of increases covering the period between then and the end of the war.

BOILER TUBES—	Seamless Per 100 feet	Lapweld Per 100 feet
1 inch	$32 00	$.....
1¼ inch	36 00	.....
1½ inch	39 00	32 00
1¾ inch	39 00	32 00
2 inch	45 00	32 00
2¼ inch	48 00	34 00
2½ inch	50 00	40 50
3 inch	58 00	45 00
3¼ inch	.....	52 00
3½ inch	70 00	54 00
4 inch	80 00	67 00

Lower Prices Named on Sheets

SHEETS, PLATES — Lower prices have been named in some quarters on both galvanized and black sheets, the former coming down about 80c and the latter from 50c to 80c per 100 pounds. Prices named herewith are, it is indicated right in line with quotations from the mills and that lower prices than these will develop is not probable unless mill figures are revised; this is not an immediate prospect. The tonnage coming to hand is good and jobbers generally are in a position to take care of all business offering. The demand just at the moment is not heavy but activity is looked for at an early date.

BLACK SHEETS—	Per 100 lbs.	
10 gauge	$6 00	$7 00
12 gauge	6 05	7 10
14 gauge	6 10	6 70
16 gauge	6 20	6 75
18-20 gauge	6 80	7 30
22-24 gauge	6 85	7 35
26 gauge	6 90	7 40
28 gauge	7 00	7 50
3-16 inch plate	....-	....- 7 40
¼ inch boiler plate	....-	....- 7 00
GALVANIZED SHEETS—		
10¾ oz.	$8 50	$9 05
U.S. 28	8 20	8 75
U.S. 26	7 90	8 35
22 and 24	7 75	8 30
18 and 20	7 60	8 15
16	7 45	8 00
12 and 14	7 35	7 90

Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

Lead Pipe and Waste Holds; Solder Down

LEAD AND ZINC PRODUCTS—No further change has developed in lead and zinc products, although lead sheets are being quoted down to 11c per pound in some quarters. The market declines in lead will, it is felt, work out in a lowering of values in traps and bends though no revision is yet reported.

Lower price levels have again been reached in solder and the basis now prevailing is given as follows: guaranteed, 38 to 40c per pound; strictly, 34 to 37½c; commercial, 31 to 33¾c; wiping, 30 to 31c; wire, 45½c. Full range of prices is shown herewith:

Lead pipe, lb.	....	$0 13
Lead waste pipe, lb.	....	0 14
Lead traps and bends	....	Net list
Lead wool, lb.	..	0 14
Lead sheets, 4 to 6 lbs., sq. ft., in rolls, lb.	0 11	0 12½
Cut sheets ½ to ¾c lb. extra and cut sheets to size, 1c lb. extra.		
Solder, guaranteed, lb.	$0 38	$0 40
Solder, strictly, lb.	0 34	0 37½
Solder, commercial ,lb.	0 31	0 33¾
Solder, wiping, lb.	0 30	0 31
Solder, wire, lb.	....	0 45½
Zinc sheets, per lb	0 16	0 20

New List Old Materials Announced

OLD MATERIALS — As indicated in last issue of SANITARY ENGINEER, a new list of scrap metals and other lines was being worked out. This is now available and in it some very severe cuts have been made in the prices that dealers will pay. It is indicated that the list was not put out with the idea of stimulating trade, for an announcement that prices dealers will pay have been cut to pieces is hardly calculated to help matters this way. A leading Toronto dealer when asked if anything was coming in at the new low levels said, "There is practically no business going on at present. Many of the yards are going over their business for the year. As a matter of fact we do not want to buy, and sellers do not seem anxious to dispose of their holdings at present rates. I can't see where there is anything in the immediate future that is going to improve matters much either. For all practical purposes we are simply sitting on the fence at the present time."

Dealers' Buying Prices

Tea lead	0 03½
Heavy lead pipe	0 05
Yellow brass	0 08
Red brass	0 10
Light brass	0 06
Heavy zinc	0 05
Heavy copper	0 15
Stove plate, per ton	14 00

Ingot Metals At Lower Levels

INGOT METALS—A general revision in ingot metals is reported this week and dealers express the view that the bottom has been reached for some time to come. Stocks are in very fair shape, it is said, and future prices will follow the markets more closely. Copper, tin, spelter, lead and antimony have all been affected. Lower levels may develop in the coming months, but these are not an immediate prospect it would seem.

COPPER—Lower price levels have been reached on copper, quotations now ranging from 25c to 28c per pound. There is some interest being shown in this metal, though demand is not exceptional.

TIN—A decline in tin has been re-

(Continued on page 32)

Annual Meeting of Toronto Society

Reports of the Various Chairmen Submitted and Passed—Outlook Very Encouraging —Members' Attendance More Active—Dues Paid Up Well in Advance— Presentation to Corp. Harry E. Griffith, Now Returned From Overseas

THE reports of the chairmen of committees and officers for 1918 were received, as well as the newly appointed chairmen and committeemen being announced for 1919, and other important business that came before the meeting being acted upon..

President Frank R. Maxwell, of the Ontario Society, officiated as chairman for the meeting, in the absence of President-elect Thomas Ferguson, who was ill with an attack of the flu.

Corporal Harry E. Griffiths, one of the members who has been overseas, and who recently had been returned to Canada, was present, and received a cordial welcome among the members. Secretary Frankland, on behalf of the society, presented Corporal Griffiths with a fountain pen and a cabinet of reminders of "Over There" in the shape of "fags." In reply, Corporal Griffiths thanked the members of the society for their welcome, and assured everyone that he was glad to be back again, and hoped to be soon in harness and doing his bit at the old stand.

Chairman Fred A. Wiles, of the Educational Committee for 1919, outlined a proposal to hold an open meeting for the entire trade in Toronto, at which Mr. John Kirkwood, advertising counsel, would be secured to address the craft on "The Cost of Doing Business" or "Co-operative Advertising." Further particulars to be announced later, it being the idea to arrange for same at an early date, in conjunction with the different "Ender Clubs."

Messrs. F. R. Maxwell and Secretary Frankland reported on several conferences held with representatives of the Builders' Exchange and other organizations, in reference to affiliation with the Canadian Association of Building and Construction Industries; and it was approved that a special meeting be held to consider this and the report of Secretary Frankland as delegate to the Ottawa conference of the above.

The chairmen and members of the committees for 1919 were approved as follows:

Executive Committee

Vice-President Kenneth B. Allison, chairman; chairmen of committees, members of executive.

Finance Committee

President Thomas H. Ferguson, chairman; vice-president, treasurer and secretary, members.

Trustees Board

George McGuire, chairman; Messrs. George Clapperton, Frank R. Maxwell, Thomas B. Smyth, Harry G. Waterman and John Wright, members.

Advisory Board

Fred H. Gentle, chairman; chairmen of committees, members of Board.

Sanitary and Legislation

John Wright, chairman; Messrs. Norman Swanston and Fred A. Wiles, members.

Heating

Harry G. Waterman, chairman; Messrs. Wm. Mansell and Wm. G. F. Sheppard, members.

Arbitration

Alex. S. Purdy, chairman; Messrs. Harry G. Waterman and John Wright, members.

Apprenticeship

George Clapperton, chairman; Messrs. Thomas M. Maxwell, John Wright, Fred H. Gentle and Harry G. Waterman, members.

Educational

Fred A. Wiles, chairman; Messrs. William J. Hall and Harry A. Weinraub, members.

Entertainment

Harry A. Farthing, chairman; Messrs. George H. Cooper, John A. Lillie, members.

Membership

Kenneth B. Allison, chairman; chairmen of Ender Clubs, members.

Standardization

Lewis LeGrow, chairman; Wilfred E. Ramsey and George R. Baker, members.

Workmen's Compensation

Frank R. Maxwell, chairman; Harold J. Hillier and Albert H. Read, members.

President's Report, 1918

Gentlemen:—

As the recipient of the highest honor in your bestowal for the past year, I express my deepest gratitude, and trust that my effort was in keeping with your expectations of me.

I wish to express my hearty thanks to the officers and members for their constant support, and I have no hesitation in saying that the affairs of our society to-day are on the most solid basis in its history, due entirely to the unqualified and generous assistance at all times given in its interests, by the members of your executive committee, in addition to your valued support.

The agreement with our journeymen as entered into during the year is, I am sure, gratifying to all parties interested, and ought, in a great measure, to assist us to get over the coming period of restoration.

The future can only hold prosperity for our business, and while we have all come through the trying times of the past four years, each one of us should strive to be in a position of readiness for the resumption of work that has been deferred during the period of the war.

The enactment of Plumbing Regulations and Examination Boards has placed us in a most enviable position, and it behooves each one of us to safeguard our rights and interests in this particular regard.

Heating regulations are under way as essential to the safety of our property and to life, all of which must tend to make us a more important factor in the community of which we are a part.

I again thank you on my own behalf, and also on behalf of my assistant officers and executive, and regret my inability to be with you on this occasion through illness, but assure you that in the near future I will be available in whatever capacity I can serve you.

Yours truly,

A. S. PURDY,
President.

Secretary's Report

January 15th, 1919.

Mr. President, Officers and Members:

I appreciate, gentlemen, that another year has gone its round, and that now at the inception of 1919 we have passed another milestone in our society that can only be looked back upon with the deepest pleasure by us all, for not to mention the success our organization has enjoyed, we have the cessation of hostilities in the world war—that has been waging since August, 1914—to remember it by.

I cannot mention anything that gives me more pleasure than the fact that more than ever our members realize the necessity of "carrying on" in a proper business manner, and I look forward to the day, and from all signs it is not far distant, when all who engage in our business will operate from a proper place of business accessible to the public, and in that way become more efficient merchants and salesmen. So many are only mediums for the installation of goods that they have no part in the sale of, and therefore receive no profit on, the goods they instal.

That the opening of proper places of business will, in a great measure, overcome the many evils of our trade to-day is very apparent to me, and I hope and trust that this remedy will be effective in the general welfare of all.

I have given considerable thought to the financing of our organization, and the more I go over it, I am of the firm belief that we must have a more equitable method of assessing our members, so that the benefits of the society are proportioned according to the business done by the different members. I suggest a minimum annual fee, and addi-

tional assessments on wage roll, as shown in connection with the Workmen's Compensation assessment. By this method all would pay equally for the privileges secured through our society.

In the addition of Messrs. John D. Smith, Lou Palter, Charles C. Ormsby, John Matthews, and Wimpenny & Byrne to our ranks in 1918, we continue to build our institution along the lines of strength and right for all enaged in our craft and business.

I thank one and all for the hearty support rendered me during the year just closed, and bespeak for a continuance of same throughout 1919, and with best wishes for our continued success.

Yours very truly,
GARRETT F. FRANKLAND,
Secretary.

THE TORONTO SOCIETY OF DOMESTIC SANITARY AND HEATING ENGINEERS
Financial Statement from January 1st, 1918, to December 31st, 1918
TREASURER'S STATEMENT

Revenue		Disbursements	
Date, 1918		Office Rent	$ 180.00
Jan. 18—Cash from Secretary	$ 440.87	Hall Rent	30.00
Feb. 22—Cash from Secretary	240.00	Salary, Secretary	1,560.00
Mar. 25—Cash from Secretary	110.00	Telephone	52.00
May 31—Cash from Secretary	377.72	Office Expenses	128.09
July 11—Cash from Secretary	360.04	Printing	60.25
Sept. 7—Cash from Secretary	273.34	Treasurer's Honorarium	100.00
Oct. 4—Cash from Secretary	250.00	Ontario Society per cap.	200.00
Nov. 8—Cash from Secretary	20.00	Entertainment Committee	237.10
Dec. 6—Cash from Secretary	50.00	Builders' Exchange, Donat'n.	25.00
Bank Interest	16.94	Delegate to Ottawa	50.00
	$2,138.91	Overseas Boxes	30.00
Cash in Bank, Jan. 1st, 1918	609.41	Wreath, Jas. O'Neil, Inspec.	10.00
	$2,748.32		$2,662.44
		Cash in Bank, Dec. 31st, 1918	85.88
			$2,748.32

Audited and found correct,
A. H. READ,
M. R. H. DANIELS.

All of which is respectfully submitted,
THOMAS M. MAXWELL,
Treasurer.

Toronto, 7th January, 1919.

Auditors' Report

Gentlemen:—

As your auditors for 1918, we beg to say that we have examined all the books, cheques, vouchers, orders and receipts of the secretary and the treasurer, and find same correct in every particular.

We congratulate the members on the exceptional good showing of the financial affairs of the society, and note with extreme pleasure that all the members' dues for 1918 were paid early in the year.

The work of these two officers is also to be commended, and we compliment the society on the splendid manner in which their books and records have been kept.

Bank statement being—

Total receipts	$2,748.32
Total disbursements	2,662.44
Balance in bank	$ 85.88

All of which we respectfully submit for your approval.

A. H. READ, Auditor
W. R. H. DANIELS, Auditor.

Report of Chairman of Heating Committee

Dear Sirs:—

As chairman of your heating committee for the past year, I beg to make the following brief report:—

All questions pertaining to the heating business which have been brought to my attention during the past year have been properly taken care of, and I trust that in future our members will make more use of the heating committee for the benefit of what we might call the "Small Contractor," or new man starting in the heating business, of whom there are quite a number from year to year established when speculative building is good.

There are numbers of these men who spring into existence who are more or less detrimental to the contractor who is operating an established independent business. I mean by independent, a heating man who is capable of sizing up any kind of a heating problem for himself, and who has sufficient conviction in his own reasoning to act upon it without asking advice from a number of people, who know less about it than himself.

I hope that our society will, in the not distant future, see fit to establish an office where heating plans, suggestions and layouts may be approved by one who is competent to rectify errors and check up figures in such a manner that the little contractor will soon be enabled to take care of himself, as far as laying out and figuring a heating job goes, without having to ask the advice of parties whose sole object is to sell a bill of goods and to get the little contractor's price below every other price in sight—quite regardless of whether he gets sufficient to pay for the goods out of the contract price, without considering such items as labor, overhead expense and profit. I am of the firm opinion that to establish a clearing office of this nature would be to cement our membership together and so have an opportunity of educating them into making a profit.

These few remarks contain the foundation of my idea, and at this time of suggestion I will not burden you with many details, which might be discussed were these suggestions acted upon.

Yours sincerely
H. G. WATERMAN.

Educational Committee's Report

According to custom, I, as your chairman for 1918 of the Educational Committee, must give an account of my stewardship, and if there is a feeling going through you that nothing appears to have been done (which I am inclined to grant from your viewpoint) then you will forgive me if, in trying to defend myself, I in turn criticize you. I trust you will receive my words in the same spirit that I give them, viz., for the sole welfare of every fellow-member.

As a result of our memorable trip to Buffalo early last year I prepared a paper in which I tried to bring back helpful suggestions to this society. Among these I suggested that in place of our secretary being the mouthpiece for each and every one of us, that the chairmen of the several committees should be present at all general meetings and personally report on all matters which pertained to the committee of which they were chairmen. It was not acted upon in 1918, but I know that this matter has now been brought to a head and will be in future so acted upon. I also suggested a Booster Box as the means of aiding members to dispose of stock, which was slow moving on their hands, and also to purchase from other members stock which conditions might make it hard to otherwise obtain. This matter likewise you have neglected to act upon. Am I to assume that your indifference to it signifies your complacency with things as they are, or your dubious feeling as to the practicability of the suggestions?

The re-sale price book, which I circulated, proved of benefit to those who saw fit to use it, and I wish to go on record here as appreciating very gratefully the active assistance which these members rendered me, and to assure them that I fully believe that I may in the very near future be able to present the results of other actions, which I have taken entirely because of that same active assistance.

A large advertising proposition for "Bigger Business" also occupied a lot of my spare time—Mr. Belyea working with me. I prepared considerable ad. copy and corresponded not a little with our fellow craftsmen across the line, but finally war conditions and the necessity of conservation prompted us to withhold this scheme to a more favorable time. Regardless of the details of the policy, publicity has to come if we are to raise our business to the higher status to which it rightfully belongs.

We also held two meeting nights wherein some added feature was thought to have been a good inducement to get the lagging member out, but I am sorry to say that we did not receive the support in attendance that our work justified. The influenza epidemic also rendered void what I believe would have been our most helpful meeting in 1918, and we therefore had to forego until later an address by Mr. Kirkwood on Advertising. If I might humbly make a suggestion for the future work, might I say that, from a business standpoint, more than a mechanical one, we should use our best efforts to raise the status of the trade to a profession by continually advocating all things that tend to

betterment as the proposition of a merchant. You know that whether we are looking for a job or just selling peanuts, we are in the same class—salesmen, and if more of our efforts were turned to scientific salesmanship we would the more readily grasp financial costs, overhead, and profit. Many members of our profession appear to think that to be a practical mechanic and be well up in matters theoretical, is the essential part of the business. But I fail to see how one can carry on a business, unless he knows how to conduct his business in such a way as to make a sufficient margin, which will enable him to pay his just debts and put a little away for a rainy day every day. Surely the laborer is worthy of his hire. Then he should be as practical in business management as he is in mechanical work. Neither departments can succeed alone.

Yours respectively,

KENNETH B. ALLISON,
Chairman.

Entertainment Committee Report

Gentlemen:—

During 1918 we enjoyed the hospitality of our Buffalo cousins, and later were favored with the honor of their visit to us, at the time of our Exhibition. That the elements were unfavorable during their visit was most unfortunate, but we look forward to another opportunity of bestowing our good cheer, with less moisture, upon them on the days we choose for the event.

Several features were arranged for our monthly meetings during the year, and we trust to have more of these in 1919, when we hope more of the members will avail themselves of the opportunity of attendance.

Thanking you for the confidence you have again shown in once more electing me to your executive committee, and trusting that my endeavors in the coming year will warrant your action, I am,

Yours to command,

HARRY A. FARTHING,
Chairman

Committee Report on Workmen's Compensation

Mr. President, and Fellow Members:

I will give you a few of the recent items that have received your committee's attention in connection with the Workmen's Compensation Act.

The new system of Merit and De-merit marking in connection with the Act is now in operation, as, no doubt, some of you have learned, through the Board forwarding to you a refund if you were in the Merit class, or a request for additional assessment if you were unlucky enough to be in the De-merit class. While the Merit side of this system is very satisfactory, I do not approve of the De-merit side, as I believe it is not fair to penalize any one for an accident that is out of his control, besides the unfair feature of extra assessment, which you will find it impossible to secure from your clients, thus being a hardship on the contractor.

The method of arriving at this extra assessment and refund is most complex. and needs to be figured out carefully so that you can understand it. A copy of the pamphlet as issued by the Board will explain the matter thoroughly. Myself and Mr. Read attended with delegation from the Builders' Exchange on the Premier, in protest of the requests made by the Labor deputation, that the Act be amended as follows. Our requests were promised the careful consideration of the Cabinet.

Clause Five was the only item that we approved, all the others were considered of too drastic a nature for enactment.

1. That the present rate of 55 per cent. of the workmen's former wages was inadequate to meet the liabilities.

2. That the entire cost of all accidents should be borne by the various industries covered by the act, and that injured workmen should receive compensation to the full extent of their former wages.

3. As a lot of time is lost owing to weather conditions, the men should be compensated on the basis of union, or the prevailing rate of wages paid in the cities or towns.

That the medical provision of the Act, which at present only covers the first month of disability, should cover the whole period.

5. That the scope of the Act should be broadened to include private companies not engaged in the building trade.

6. That widows should receive at least $30 a month for themselves and $10 for each child under 16, instead of $20 a month and $5 for each child, up to a maximum of $40, as at present.

Assuring you of our further attention to your affairs in this regard, I remain,

Yours truly,

F. R. MAXWELL,
Chairman.

Lower Prices on Boilers and Radiators May Come

THE announcement made by the American Radiator Co. on January 1, that new prices approximating a decline of 25 per cent. in boilers and radiators had been made has caused considerable comment in Canadian trade circles as to what action, if any, was contemplated by the manufacturers of similar lines here.

That lower prices will be reached seems probable but just how much the decline will be is still somewhat uncertain, probably in the neighborhood of 10 to 15 per cent. on boilers with a smaller amount on radiators. Comparison of prices prior to the issuance of this latest price in the United States markets favored the Canadian manufacturers. The object of this article then is to show the present disparity between the two and outline facts which may be expected to bring about a lowering of values on this market.

Starting with round water boilers there is no great difference in prices to the small buyer. American sheet prices on No. 4 round water boiler show a cost to this class of buyer of $128.80, which with a 35 per cent. duty would bring the laid-down cost to about $173.88. The present Canadian price is $171.00, a slightly lower figure.

However, when one comes to the usual export price to the larger buyers there is a different story to tell. With the extra discount allowed on this business there is a net difference of 10 to 20 per cent. between the United States and Canadian prices, the former being that much lower. The No. 7 boiler, however, does not show this difference, in fact, practically no difference at all. Usual prices to the larger buyers on these show a cost when imported from the United States of about $299.38 laid-down, whereas the Canadian price figures out at $303.24, so no reduction on these need be made. A factor in making comparisons that must be borne in mind is the one that Canadian boilers have to be supplied with branch headers, whereas imported boilers do not have these, so considering this point, the difference in price is not so marked. Figures show that probably 75 per cent. of round water boilers sold are Nos. 3, 4, 5 and 6, and on these it seems probable that a further discount of around 10 per cent. in Canadian prices may be allowed.

In round steam boilers, however, there is a greater difference in figures prevailing to-day. Owing to the Government regulations which apply in the various provinces it is difficult to make comparisons. American boilers are quoted without safety valves, whereas in Ontario special approved steam trimmings are necessary and a Government fee for registration is charged. In addition to special trimmings and registration, in Alberta it is necessary to have special brass plugs for clean-out purposes installed which means additional expense. However, considering all these factors, it seems that some very material reduction may be looked for amounting to anywhere from 10 to 15 per cent.

On the square type water boilers the larger type show somewhat greater difference than the smaller. However, it would appear that present figures may be revised to the medium and large buyer providing for a decline of from 10 to 15 per cent.

The difference in square type steam boilers seems to be much greater than that on square type water, but here again con-

Continued on page 32

PRACTICAL SHEET-METAL WORK

THREE PIECE ELBOW WITH GUSSET OR GORE PIECE.

BY THOMAS STANSFIELD

IN this issue is shown a flaring article round in plan at top and bottom, but with one side in elevation square with ends, as shown by A-C-D in elevation.

The first step is to draw plan with two circles, divide both circles in plan into the same number of equal parts as shown by 1-2-3-4, etc., and A-B-C-D, etc., in dividing the two circles start at the end of diameter on inner circle which is parallel diameter on outer circle. Then draw lines, joining these divisions as shown by 1-A-2-B-3-C-4-D-5-E, etc., and with these distances as bases and with straight height of elevation at A-C as an altitude form the angles shown at L-M-N-O.

The pattern could not be laid off with angles derived from lines as above described, as it is necessary to form another set of angles; the base lines of these are drawn so as to join the ends of two adjoining lines drawn from division points, as shown by dotted lines joining 9-H, 8-G, 7-E, 6-E, 5-D, 4-C, 3-B, and 2-A.

With these lines as bases and same altitude as described above, from angles as shown at R-S-T-V and X. To lay out pattern 1-A, making it equal to A-C on elevation, this gives us points 1 and A shown on plan.

To obtain the next point on either top or bottom of pattern it is necessary to work from 1 to B as a base on plan or from A to 2, as shown in the connecting or dotted line from A to 2.

Now take distance R-2 and angle formed with A-2 as a base line, and with point A in pattern as a centre, draw an arc near point 1, with one division of plan of base as a radius, as 1-2; then draw an arc from point 1 on pattern intersecting one drawn from A, thus obtaining point 2; this gives us points 1 and 2, and A. To obtain the next point B, take distance L-B formed with base line 2-B, and using last obtained point 2 as a centre and draw an arc near point A intersecting it with one drawn from A, having a radius equal to one division of plan of top, as A-B; lay out all the remaining angles working as described form B to 3 on dotted line, B to C on solid line, C to 4 on dotted line, 4 to D on solid line until the line 9-K or one-half the pattern is set off, when a line drawn through the points obtained will give outline of one-half pattern, which can be used to mark off balance, or the above can be laid on opposite side of line A-1 as shown as suits one's purpose.

(Continued in next issue.)

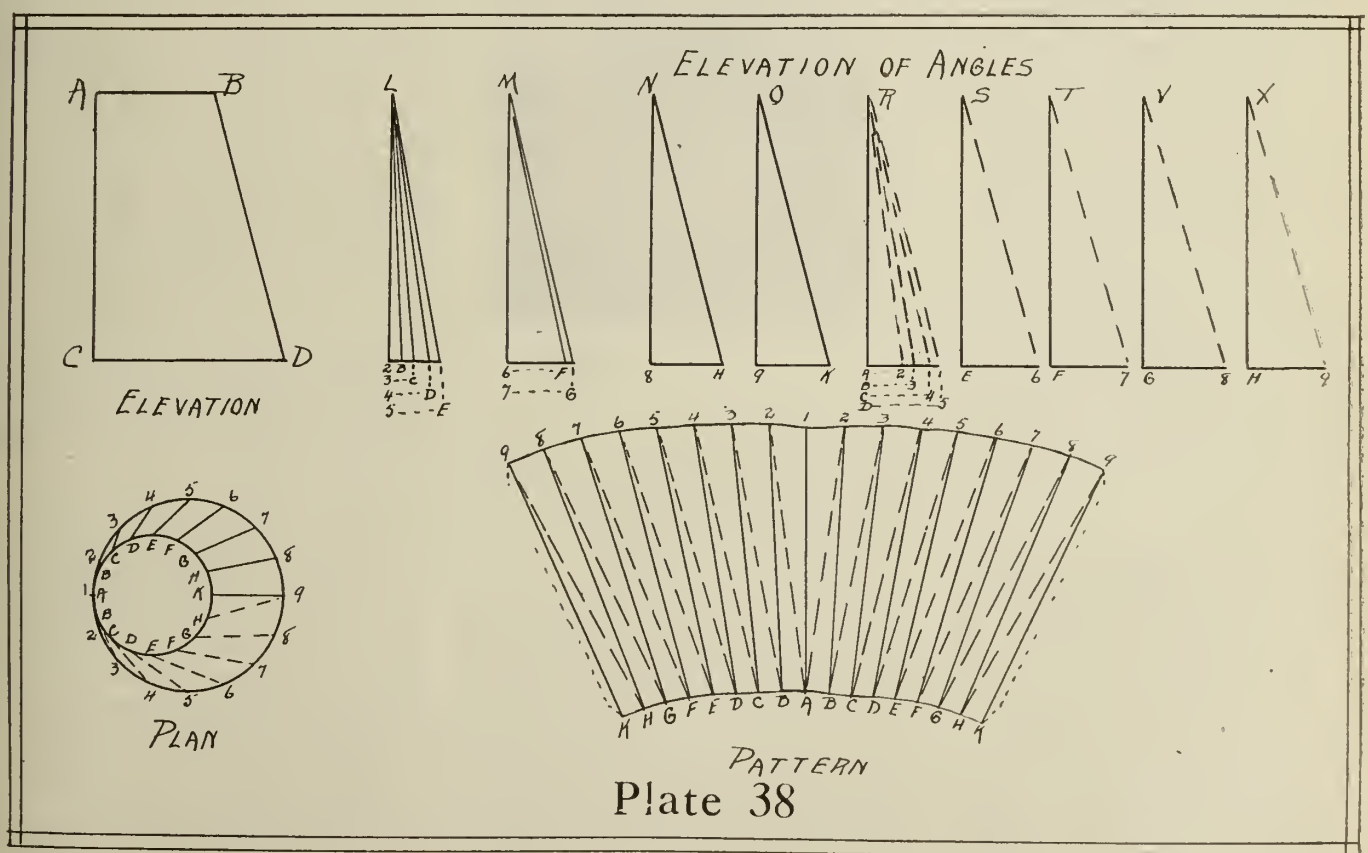
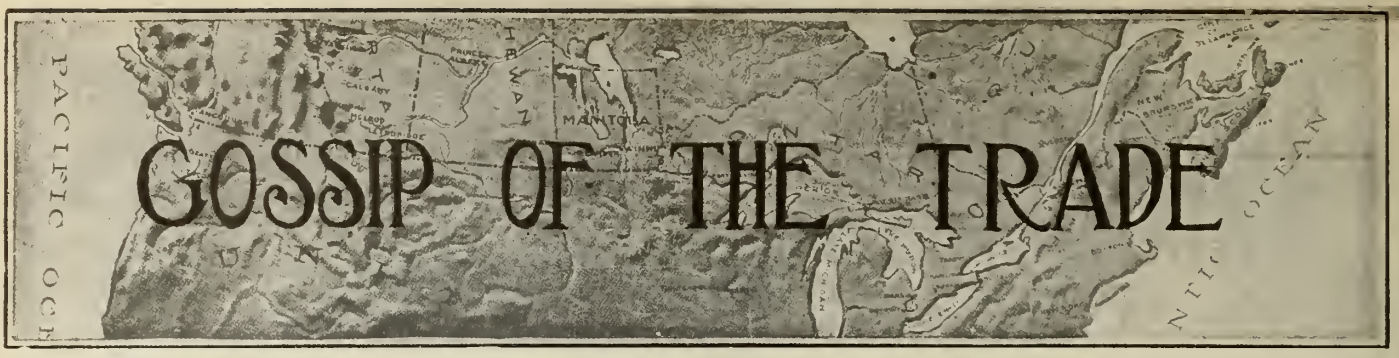


Plate 38



GOSSIP OF THE TRADE

CALLED AT OUR LONDON OFFICE

We had a letter from our London, England, office, stating that a reader and subscriber to SANITARY ENGINEER from Canada, in the person of Clarence E. Paddon, son of Robert Paddon, of Windsor, Ontario, paid a visit there. We are informed that our friend "Clarence" is recovering nicely from a wound in the knee. He was a victim of the Hun when on active service and has been an invalid for several months in one of the hospitals over there, but expects to be on his way back soon to the land of the maple leaf.

TORONTO SANITARY ENGINEER ESTABLISHES HARDWARE BUSINESS

Many of the Toronto friends of Lou Palter will be pleased to learn that he has made another important move—not only in location but also in expanding his business. Mr. Palter began business some five years ago on College Street West and did a nice plumbing and heating business, conducting, too, a very attractive show room, and making his store windows help him in an advertising way.

His new location is 668 Bloor Street West, and he has added to his business by including a hardware and stove department, thus becoming more of a merchant than in the earlier stage of his business career. Mr. Palter believes that the first step towards making a success in any business is to become a salesman and the next is to know the goods one sells. We believe he will make further progress as time goes on, and would hail with delight the time when every member of the craft would begin to realize that the biggest drawback in the sanitary and heating profession is lack of salesmanship. What is the use of acquiring knowledge if one does not know how to sell that knowledge?

RETURNED FROM OVERSEAS

The many friends of the trade in Toronto will be pleased to learn that Major G. Allan Keith, of Keiths, Limited, has now returned from overseas, where he has been doing his bit to make things hot for autocracy and the Hun. He hopes soon to be on active service in a more peaceful occupation in the heating business in Toronto.

Another member, too, is back on the job in the person of Corp. H. E. Griffith. Mr. Griffith established a plumbing and heating business some years ago on College street and shut up shop to go overseas. We are all pleased to hear that he, too, hopes to be back among boilers and radiators, etc., very soon.

A LETTER FROM GERMANY

The editor received a very interesting letter the other day from Staff-Sergt. Harry Ruddick, of Toronto. He enclosed a Christmas card, and explains the reason why it is late in arriving. Some of his Toronto friends in particular will be pleased to hear from Harry, and

Staff Sgt. H. Ruddick, M.G.C., recently Decorated with a D.C.M.

as he wishes to be remembered to some of them the editor thought it would not be out of place to publish the letter in full, which reads as follows:

Staff.-Sergt. H. Ruddick, 843,
1st Btn. Can. M. G. Corps,
B. E. F., Germany

Dear Friend,

I am afraid that the enclosed card will be a little late for its purpose. They were printed in England, and, owing to delay in the mail they did not arrive until a couple of days ago. Please accept it as a small souvenir from our unit, who are now part of the army of occupation in Germany. The people of Belgium treated us very well during our march through their country towards the frontier. They had heard of the great doings of the Canadians during the war and in many different ways they showed their appreciation of our services. After crossing the frontier into Germany our reception was rather mixed. The majority of the German people seemed to be friendly enough, but some would have caused trouble if they dared. We are now billeted in a small town across the Rhine, about eight miles up the river from Cologne. When outdoors all ranks are armed, either with bayonets or loaded revolvers. Civilians have to strictly comply with our army regulations and have to be indoors at 7 p.m. We have no idea how long we may be kept here but you can guess that our one thought is to get back to dear old Canada again. I certainly did not think when joining up that I should be four years away from home. We are cheered in knowing that our object has been attained and that our great sacrifices have not been in vain. How are things in the sanitary and heating business? I expect to see things booming again in Canada in the near future. Sanitary engineers are and will be much needed in France and Belgium, but I would rather do my bit in that line in Canada. Mrs. Ruddick tells me that you ring her up on the phone once in a while. It is very cheering to her that friends keep in touch, if only by phone. I am sending a bunch of cards off, so please excuse short note. Kindly remember me to any of the old boys whom you may run across.

Your sincere friend,
HARRY RUDDICK.

AS WE GO TO PRESS

It will interest the many friends of Staff-Sergt. Harry Ruddick, Toronto, that he has been awarded the Distinguished Conduct Medal since the above letter was written.

NEW APPOINTMENTS MADE

The C. A. Dunham Co., Ltd., Toronto, announce that a change has been made in their branch sales office at Montreal. Mr. A. Kastello, recently superintendent of construction for the Imperial Munitions Board at Trenton, but formerly with the Dominion Government and Grand Trunk Railway, has been appointed new branch manager in charge of their office at 711 New Birks Building.

Mr. Kastello is to be assisted in the company's growing business by Mr. F. O. Hamel as heating engineer, formerly first assistant engineer in the Public

Works Department, Dominion Government at Ottawa.

The C. A. Dunham Co., Ltd., are very optimistic over the prospects of building activity, and this change has been made to strengthen their organization and to render better service to their trade and clients in Montreal.

JUST PASSED ON

With the "passing on" of Matthew Barr, one of the late partners of Messrs. Barr & Anderson, Vancouver has lost a good citizen and splendid business man. This concern employed quite a number of men, and Mr. Barr was well liked by all who knew him. The firm occupies very fine premises at 1060 Homer Street, Vancouver, B.C. Many of the buildings show the marks of the skill and ability of our late fellow craftsman.

DOWN WITH "FLU"

The friends of Roy E. Belyea, of Belyea Bros., Toronto, will regret to learn that he is confined to his home with a severe attack of the "flu." Mr. Belyea is one of the coming men in the sanitary and heating engineering field. He is building up a splendid business, and both he and his brother are very active workers in the Toronto Society of Domestic Sanitary and Heating Engineers. One of Roy Belyea's chief ideas about conducting a business is that the public are always right. He believes in publicity and has devoted no small amount of time to the society above mentioned in trying to work out an advertising publicity campaign.

A TRIBUTE

Francis J. Torrance, Foremost Figure in the Sanitary Industry of This Continent

It can probably be said of Francis J. Torrance, first vice-president and chairman of the executive committee of the Standard Sanitary Manufacturing Company, who passed away at his home in Pittsburgh, on Wednesday, Jan. 8th, 1919, that he, with the late James W. Arrott, was the father of the sanitary cast iron enamel ware industry of this country, if not of the world.

Not alone in the plumbing fraternity everywhere, but the jobber of plumbing supplies and the manufacturers of various utilities used in modern plumbing, such as gas pipe, soil pipe, range boilers, water heaters, brass goods, valves, closets, etc., may well pay tribute to this man. They owe a large measure of their successful development to him and to the industry in which he was such a dominant factor.

Francis J. Torrance was the first manufacturer to apply what is known as the "Dry Process" in the enameling of cast iron sanitary goods. Prior to the time of his advent into the industry, what is known as the "Wet Process" had been used in the application of the enamel to the metal. When he embarked in the business with his father and the late James W. Arrott, their plant turned out possibly three or four bath tubs per day, and even these were not perfect. Mr. Torrance lived to well realize his ideal, for the interests which he helped so greatly to promote now produce over 1,000 bath tubs per day and their proportionate amount of small ware.

When Mr. Torrance embarked in the industry, bath tubs were few and far between, not one house in hundreds contained plumbing. The public, the architect and the plumber had no confidence in cast iron enameled ware, because up to that time such ware as had been produced was of so inferior a quality that it could gain little foothold in public confidence.

The late Francis J. Torrance.

Mr. Torrance, with his associates, brought, from comparative obscurity, the manufacture of cast iron sanitary goods into the high light of a great industry. He was an advocate of sanitation in the fullest sense of the word. He, with his associates, is responsible, possibly more than any other one man, for the great spread of modern plumbing, the modern bathroom and the conveniences and comforts which sanitary plumbing means to the people. He adapted modern means and methods to the manufacture of bath tubs and bathroom appliances. He devised new patterns and improved upon the old. He cheapened the processes of manufacture. He was a great beliver in publicity, and by his sagacity, his shrewdness and his foresighteness, he with his associates developed an industry which grew from a few thousands of dollars a year to over twenty-five millions, with offices and showrooms all over the globe.

He became a missionary in the cause of sanitation. He not only undertook the arduous duty of overseeing the manufacture of the product, but he set out to call on the plumber, the jobber and the architect as well, to preach the gospel of better plumbing and incidentally to sell his goods. He opened up the forest of prejudice, and by his energy, his insistence, his affability and his confidence in his objectives, he paved the way for the development of modern sanitation, such as we enjoy to-day. One might easily say that to follow the history of sanitation on this continent in the last thirty years is to follow the history of the growth of Mr. Torrance's company.

The death of Francis J. Torrance removes a gentle, courteous, whole-souled figure; a man of charity, high minded, unselfish, devoted to noble ideals. He was generous to the needy, beloved in his family relations, considerate and kind to all. Peace and honor to his memory.

LETTERS TO THE EDITOR

Toronto, Jan. 25th, 1919.

THE SANITARY ENGINEER,
Toronto, Ontario.

Dear Mr. Editor:—

I pen you these few lines with the utmost joy on my part for I have been exceedingly gladdened of late, in perusing the columns of your worthy journal, to notice the activity that seems to have arisen in Association circles of our craft.

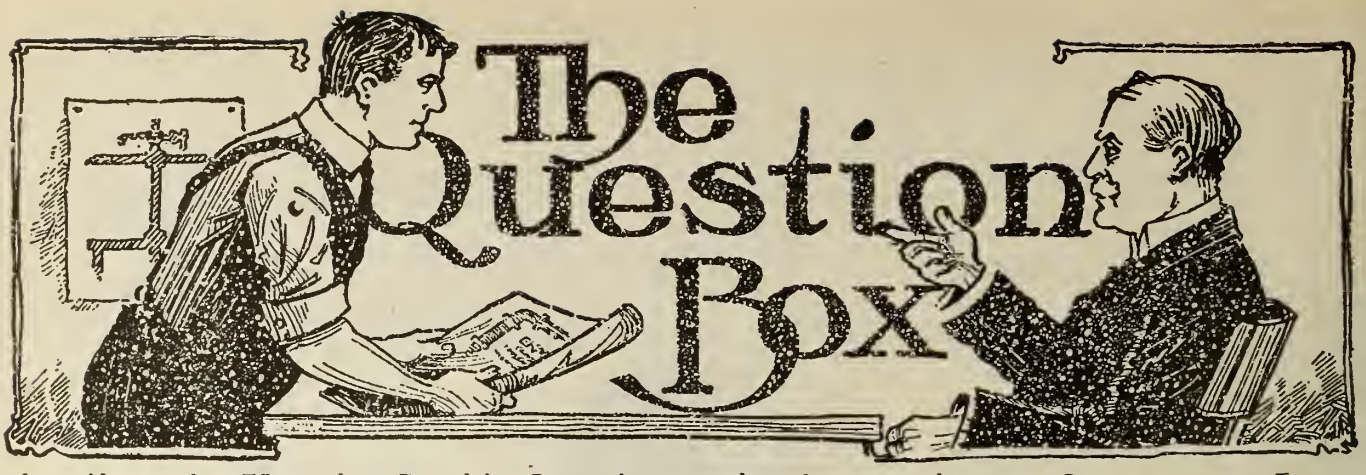
That the duration of the war must have had a depressing effect on those engaged in our calling must be conceded, because the general building programme of the country was greatly curtailed. But, now when there seem to be prospects ahead for a resumption of building and reconstruction activities along all lines throughout our Dominion, I cannot but express the feeling of hope that is within me for a bigger and better Association of those connected with the most important phases of our every-day life, viz., Light, Air and Heat.

That the coming convention in Montreal of the Canadian Society of Domestic Sanitary and Heating Engineers, to be held in June, will bring together those in the calling from all parts of Canada, is my great hope, and if the members of the craft will only avail themselves of the opportunities that now lie before them by becoming active in their organization and combining their strength, great, indeed, will be the improvement of the conditions that surround them in their business.

I trust to see further news of association affairs in your paper, and hope that some good word will be received from those throughout the Western portion of Canada, as well as from our Maritime Provinces, who always were active in former days.

Thanking you for the constant guardianship that you have ever given to the affairs of our craft, and trusting that you may long continue to be editor and guide to the most essential vocation in the world, I remain,

A CONSTANT READER.



Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published--Description of Jobs Done or Shop Kinks Are Also Invited.

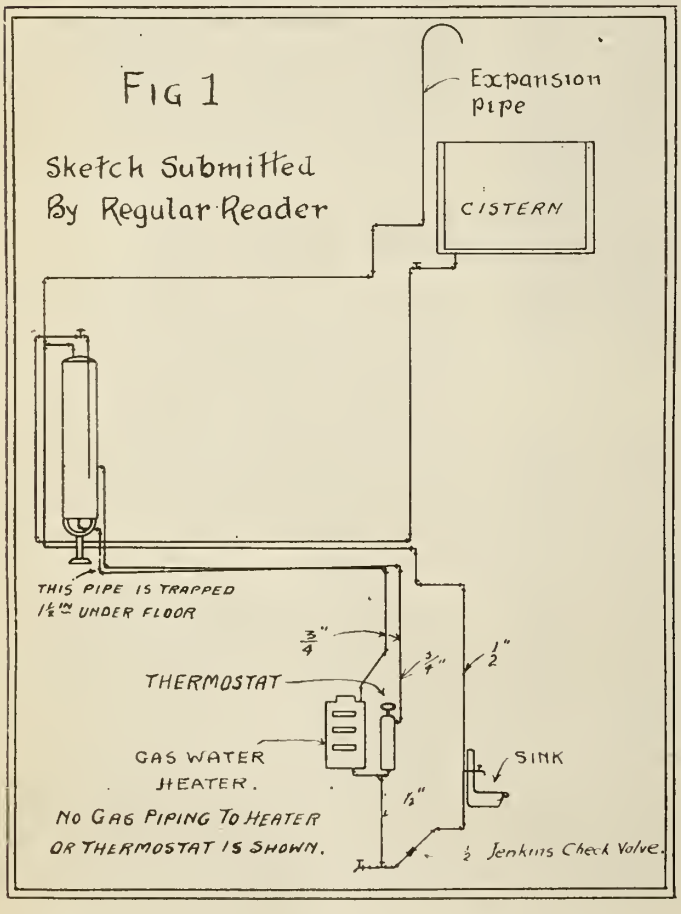
WHERE IS THE TROUBLE?

Editor SANITARY ENGINEER:

Enclosed please find sketch of an unsatisfactory job. Will you show me the changes I will have to make to ensure a proper working installation at least possible cost? If no check valve is used, is there a chance of drawing cold water at the sink? How high does the expansion pipe have to be over tank? When same was just over top, hot water ran intermittently. At present hot water rises in thermo, thereby shutting off the gas. This was an old job in the first place and heater had to be placed as shown.

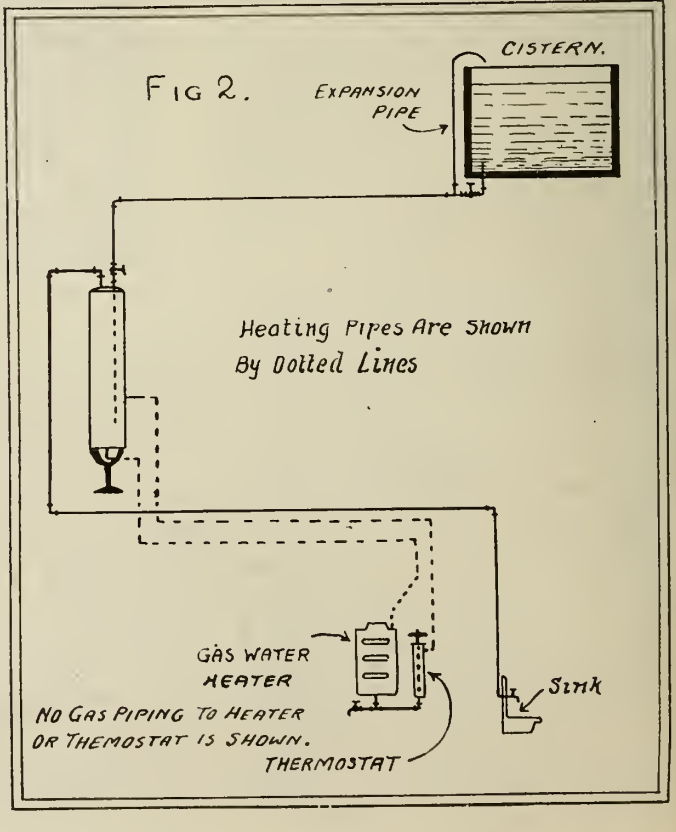
A Regular Reader, N.H.B.G.

In the first place, the cold supply to the range boiler should be connected direct to the top of the boiler, see Fig. 2. The piping under the floor must not be trapped, but rather should be pitched slightly upward.



The expansion pipe can be carried up as high as desired, but it can be taken off at the cistern as shown in Fig. 2. Regarding the trouble with the thermo closing off. This is brought about by having the hot supply pipe connected in circuit with the thermo and the heating pipe which enters the side of the boiler.

This is what happens. When the bibb at the sink is opened and water drawn therefrom the water flows just for a moment towards the check valve and is there only partially stopped, because it will be seen that as the bibb opens the columns of water on each side of the check valve are nearly equalized. There is no need for this pipe at all which is connected from bottom of heater and thermo to the bibb at sink. If this is taken out, an improvement will be noted at once. It should always be borne in mind that no circulating pipe or indirect connections should be made when a thermostat is to be used as shown on this or similar installations.——Editor.



MUELLER

Compression Sink Bibbs

SIMPLE elegance, combined with superior strength and wearing quality, is what you give your customer when you install **MUELLER** goods.

The many advantageous features of **MUELLER** compression bibbs give maximum service from the bibb as a whole. The anti-spreading device that breaks up the whirling motion of the water and the corrugated stem and handle, allowing the handle to be set at any angle without becoming loose or wobbly, are only two of these features.

MUELLER Bibbs are the best the market affords. Write for prices.

H. Mueller Mfg. Co., Limited

SARNIA CANADA

MUELLER

LOWER PRICES ON BOILERS

Continued from page 26

sideration must be given to the same conditions re Government equipment and registration as those noted in connection with the round steam boilers. This would seem to indicate that a net difference of 10 to 15 per cent. exists which Canadian manufacturers will undoubtedly adjust.

Radiators do not show such a big difference even on to-day's basis. The 2 col. steam, 38-inch, from the United States will cost the small dealer delivered in Canada $50.34, while the Canadian price is $50.85. The 3 col. water, 38-inch, from the United States to the small dealer figures out at $49.66 here, while the Canadian price is $52.80. To the carload buyer, 2 col. steam, 38-inch, will cost laid-down $45.97 from the United States, whereas comparative Canadian figure is $48.31. A 7½ per cent. reduction would not be out of line here. With the 3 col. water, 38-inch, carload buyers secure a laid-down cost from United States manufacturers of $45.38—this compares with a Canadian price of $50.16, so a 10 per cent. reduction would be quite in order.

There seems little doubt that Canadian manufacturers will bear these facts in mind and an announcement at an early date that lower levels have been reached seems a pretty safe hazard. An interesting point in connection with new prices named in the United States is that manufacturers there are guaranteeing their prices against decline. This would seem to indicate that they felt that the bottom had been reached for some time and that they are trying to exert a steadying influence on the building trade to encourage building operations. Whether Canadian manufacturers will adopt a similar selling policy along with any price revisions they may make is difficult to say, but it would not come as any surprise. Feeling that every encouragement to the building trade to start operations in a big way should be given may mean that prices will be guaranteed against decline.

A sweeping reduction of 25 per cent. in Canadian prices cannot be made and is not necessary to conform to American quotations. There are some lines which undoubtedly will come down, whereas others again may be expected to maintain their present levels. Canadian prices prior to the recent drop in the United States were well below the American figures and may be expected to be adjusted to necessary lower levels now.

At the present time the tariff issue is a live one and should the tariff be altered it may mean some further readjustments. However, it is thought that in the meantime manufacturers will work along present basis and meet new conditions which may arise, as they develop.

MARKET REPORTS

(Continued from page 23)

corded of about 2c per pound and the market is quite firm at present basis. Stocks are down to a very fair basis and fluctuations of market at primary points may influence prices here to a greater extent than they have done in the past few weeks. Quotations to-day range from 68c to 72½c per pound.

SPELTER—A slight revision downward is noted in this metal this week. Quotations generally prevailing are at a basis of 9c per pound and a fair amount of business is reported at this figure.

LEAD—The easier feeling in lead has developed into a decline in prices, but on the present basis the market seems to have touched bottom for a while at least. Quotations to-day range from 6¾c to 7c per pound; supplies are ample.

ALUMINUM—There have been no new developments here. The price in the United States is set to March 1, and little variation from present price of 50c per pound here is looked for prior to that date.

ANTIMONY—The price has sagged to 8½c per pound on antimony and conditions seem much steadier. Business is within a narrow compass at present, but a little better feeling seems to prevail as to the outlook.

PIG IRON—No startling changes are reported. A steadier feeling seems to have materialized and the trade is proceeding with the work in hand. The ocean freight rate situation is being watched carefully by United States interests in anticipation of further reductions which will enable the producers to offer their goods in markets abroad at prices which will compare more favorably with British market values.

ELECTED COUNCILLOR FIRST TRY

Thomas William Slean went to reside in Oakville, Ontario, from Toronto about eight years ago. He was born in New York City of Irish parentage, but the family came over to the land of the Union Jack when T. W. was about two weeks old. He learned the plumbing trade, and now carries on an extensive business in Oakville, and is still engaged in that line. He had the satisfaction of being placed at the head of the poll in his first municipal contest.

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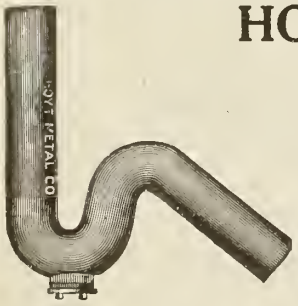

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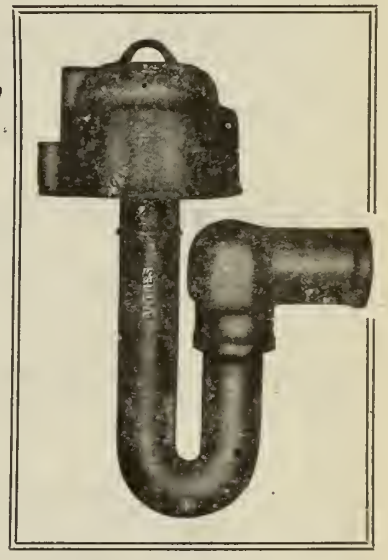

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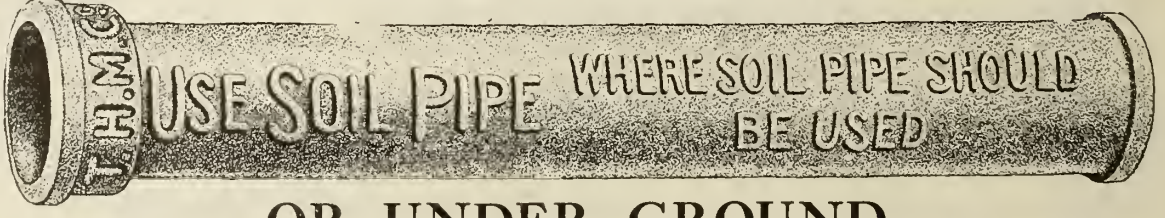

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American Technical Society 35
Anthes Foundry Co. 33
Beaton & Cadwell 39
Beaton & Corbin 40
Breeden, Jos., & Co. 39
Borden Canadian Co. 40
Bicalky Fan Co. 40
Canadian Power Regulator Co., The 6
Canadian Fairbanks-Morse Co. 34
Canadian Tube & Iron Co. 38
Canadian Wolverine Co. 7
Chamberlain Desolvo Co. 7
Canada Metal Co. 4
Commercial India Rubber Co., The.... 32
Consumers Metal Co. 40
Dart Union Co. .....Inside Back Cover
Dunham & Co., C. A. 3
Empire Manufacturing Co. .....Front Cover
Galt Brass Co. .....Back Cover and 11
Goodwin, F., Co. 6
Gummer & Co., G. W. G. 2
Hall & Sons, John H. 38
Hause Mfg. Co., Chas. F. 40
Hoyt Metal Co. 32
International Malleable Iron Co. 9
Jardine, A. B., & Co. 3
Jenkins Bros., Limited 9
Katie Foundry Co. 10
Kerr Eng. Co., Ltd. ....Inside Back Cover
Lord & Burnham 1
McDougall & Co., R. 34
McIntyre & Taylor 34
Morrison Brass Mfg. Co., Ltd., Jas. 33
Mueller Mfg. Co., H. 31
Port Hope Sanitary Mfg. Co. 12
Scaife, Wm. B., & Sons 38
Simplex Manufacturing Co. 40
Standard Sanitary Mfg. Co. 5
Steel & Radiation, Limited 8
Trimont Manufacturing Co. 38
Toronto Hardware Mfg. Co. 34
Wallaceburg Brass & Iron Mfg. Co., Ltd. 37
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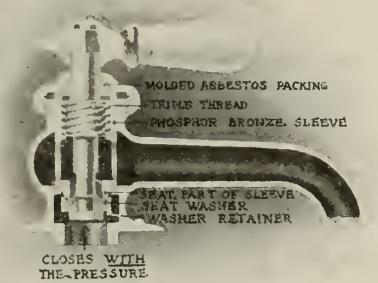

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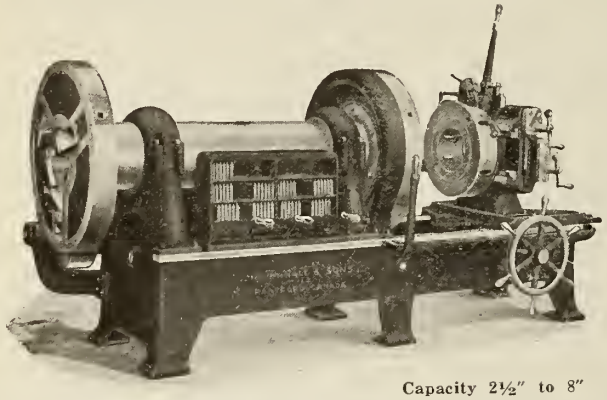

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The Wrench of 25% Greater Efficiency

TRIMO PIPE WRENCH

Two new features have been recently added to the Trimo Pipe Wrench, namely Nut-Guards, in all sizes, and unbreakable steel frames, in leading sizes.

The Nut-Guards prevent the accidental rotation of the nut while in use.

These improvements add 25% to the usefulness of the tool.

The Trimo Pipe Wrench is made with wood handles in 4 sizes, 6-in., 8-in., 10-in., 14-in. and in steel handles in all sizes, 6-in. to 48-in. inclusive.

All Trimo Pipe Wrench parts are interchangeable.

The inserted jaw in the handle can be readily replaced when worn, thus adding to the life of the tool.

Nut with Nut-Guards

Inquiries from Importers and Dealers Solicited. Send for Catalogue No. 55.

TRIMONT MANUFACTURING CO.

Cable Address: Triwrench
Code: Western Union

Roxbury (Bosotsn) Mas., U.S.A.

Steel Tanks for Every Purpose

A FEW "SCAIFE" SPECIALTIES:

Air Receivers	Filters (water)	Range Boilers
Boilers—Hot Water	Hot Water Tanks	Tanks (steel)
Expansion Tanks	Hydro-Pneumatic Tanks	Water Supply Tanks

117 years old. Founded 1802.

WM. B. SCAIFE & SONS CO.

New York, N.Y. Office: 26 Cortland St. Home Office: Pittsburgh, Pa.

Over 60,000 Daisy Hot Water Boilers Now in Use—Are *You* Selling Your Share?

Daisy Hot Water Boilers are easiest to sell because they have an established reputation for exactly meeting the requirements of the modern home.

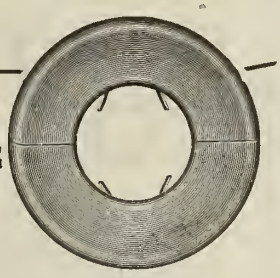
Every Daisy you instal will help build bigger business by bringing repeat orders for installation in neighboring homes later.

WARDEN KING Limited, Montreal

BRANCH OFFICE: 136 SIMCOE ST., TORONTO

OPEN VIEW
NO. 10-A

The CEILING PLATE that's better



TOP VIEW
NO. 10-A

THE NO. 10—A NARROW FLANGE PLATE—IS A STEEL HINGED PLATE. FLANGES ¾" WIDE. HIGHLY FINISHED. ESPECIALLY DESIGNED FOR TWIN CONNECTION "NARROW."

The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

High quality at the right price.

Gem No. 4.

Gem No. 4 Automatic Air Valve

Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

Write for catalog showing our complete line of specialties.

The BEATON & CADWELL MANUFACTURING Co.

New Britain, Conn.

Eastern Agent: J. R. Devereux & Co., 358 Beaver Hall Square, Montreal. Western Agent: A. E. Hinds & Co., Chamber of Commerce, Winnipeg.

Joseph Breeden & Co., Ltd.

NEW MILL WORKS

Fazeley Street, Birmingham, England

MANUFACTURERS OF

HIGH CLASS

Steam and Water Fittings

Typical Way of Drilling Wall Holes
The average efficiency with this tool over hand drilling is 5 to 1 in both quantity and quality of work.

PHILLIPS SPRING HAMMER

THE FIRST AND ORIGINAL HIGH SPEED HAND DRILLING MACHINE

These tools are very simple in construction, and built to stand up to the wear and tear and hard knocks incident to every-day drilling of concrete. Can be quickly taken apart and put together by any workman, in field or shop, without possible error in reassembling. The machine is used with breast plate and two cranks for wall drilling and with two cranks and extension for drilling in ceilings and through floors. If desired it can be used with one crank, either right or left handed.

BORDEN CANADIAN COMPANY

110 Church Street - TORONTO

Typical way of Drilling Holes-Overhead in Concvete Ceilings & Trhrough Floors. Saves time and money. Every hole a finished hole.

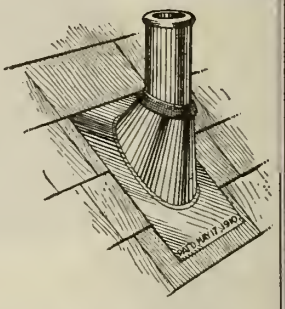
No. 1 B. & C. Automatic Radiator Air Valve

Made from the best brass with cast brass base. Screwed and soldered on, and equipped with high grade carbon. All valves tested before shipping. Use these together with our famous "B & C" Floor and Ceiling Plates and insure satisfaction.

The Beaton & Corbin Mfg. Co.
S uthington, Conn.
Stocks carried by our Canadian Representatives
Canadian Representative: W. H. Cunningham & Co.
183 Church Street Toronto, Ontario

The SIMPLEX Adjustable Roof Flange

Fits any roof from ½ pitch to flat—just slide it down the pipe and it will conform with the pitch of the roof.



Trade Price 2" $1.00 4" $1.15

Made in all sizes—For sale by nearly every jobber

Simplex Mfg. Company - Chicago, Ill.
183 Church St., TORONTO, ONT.
Canadian Representative: W. H. CUNNINGHAM & CO.,

Second-Hand Pipe

1-2" to 4"

Black and Galvanized

Send us list of your requirements

Consumers Metal Company, Limited
14 St. John Street MONTREAL
Works: LACHINE, QUE.

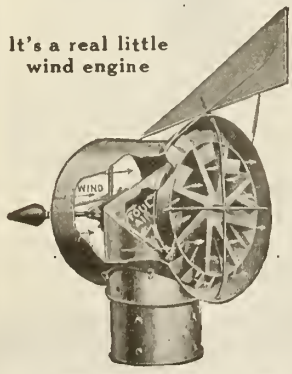
SAVE YOUR COUPLINGS

Write us what you have of the various sizes, either in pieces or pounds, and we will make you a cash price on them.

The A. & J. Mfg. Company
559 West Lake St. Chicago, Ill.

THE BICALKY VENTILATOR

It's a real little wind engine



Is a positive suction fan that ventilates

The "Bicalky" will dispense with all auxiliary heaters on local ventilation systems.

It is, as far as we know, the most scientifically constructed, self-propelled fan ventilator on the market.

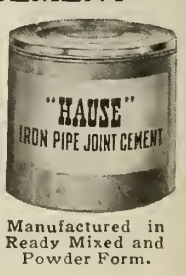
Write us for full particulars.

BICALKY FAN CO.
BUFFALO, N.Y.
Canadian Sales Agents:
J. S. Chapman & Company
89 Jarvis St., Toronto

"HAUSE" PIPE JOINT CEMENT

For steam, water, air, oil, gas, gaskets, etc. The cement that cements. Sets like gum. Allows no leaks.

The Great Value of "HAUSE PIPE JOINT CEMENT" lies in its peculiar chemical properties which permits of its hardening and expanding after the joints are made up. In making up joints it has the same effect as a lubricant on the best graphite, and while the joints may be made and broken readily, a perfectly tight joint is maintained at all times. Comes in 1-lb., 5-lb., 15-lb., 25-lb., 50-lb. cans, 100-lb. barrels. Manufactured in ready mixed and powder form. Ask your jobber for prices, or write us direct.

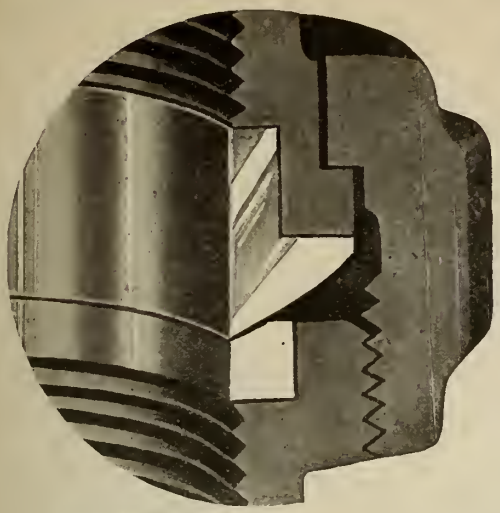


Manufactured in Ready Mixed and Powder Form.

Made in Omaha, Neb., U.S.A.,

Canadian Distributors:

Empire Manufacturing Co., Limited
LONDON and TORONTO



Why "Dart" Unions Save *Time and Trouble*

FACE AND SEAT ARE BRONZE

IRON PARTS ARE HEAVY

CONNECTION EASILY MADE

This means that there can be no rust or corrosion—no deterioration to cause loosening up and leaks.

They eliminate all possibility of stretching or pulling apart under unusual strain or heavy pressure.

Threads are exact to standard—and the ball-shaped seat allows easy connecting of pipes either in or out of alignment, so long as the nut can be started on its thread.

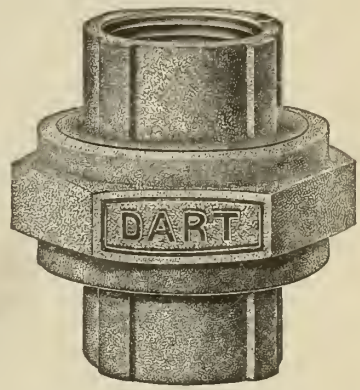
DART

Trade Mark

REPEAT ORDERS INVARIABLY FOLLOW WHEN A JOB GIVES A CUSTOMER COMPLETE SATISFACTION.

Use Dart Unions—they make a joint that stays tight **permanently.** Your customers will never be bother with leaks.

Make sure your next Jobbers' order includes Dart Unions.



Manufactured by

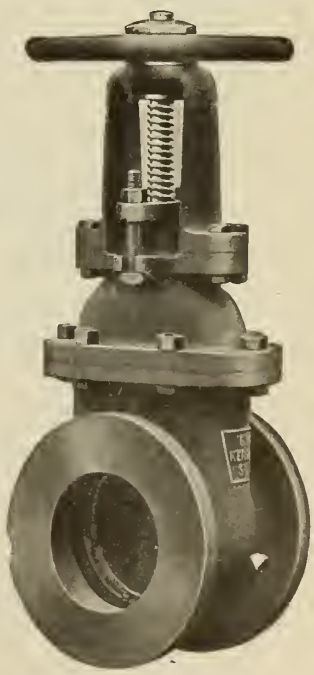
Dart Union Co., Limited, Toronto, Canada

There Are Lots of Gate Valves

Advertised and Sold

but not all of them possess that n e a t appearance, combined with strength and s t a b i l i t y, w h i c h characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.

Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.

Approved by the Fire Underwriters' Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

Who Said Trouble?

We settled all tank troubles for all time when we introduced the "Vitro" to the trade. We know that if you are trying to serve your customers in the very best way you will always recommend

Vitro No-Trouble Tanks

You cannot procure a "just as good" substitute, because there is no substitute of a "Vitro" tank made and we are the sole manufacturers of the genuine "Vitro" no-trouble tank in Canada.

Galt Brass Company, Ltd.

Galt, Canada

SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

Vol. XIII. Publication Office, Toronto, February 15th, 1919 No. 4

Don't Forget Country Business

Get right in line for some country business. Every farm home is a prospect for the Sanitary and Heating Engineer. Empire Pneumatic Water Systems are built by some of the finest experts on this continent. Every feature that stands for lasting and efficient service is embodied in our line.

Scores of our customers are making a specialty in developing country trade and find that there is less trouble, less worry and more profit when they instal Empire Pneumatic Water Systems.

We can furnish you with every article you need on a country job.

Empire Manufacturing Company, Limited

London :-: Toronto

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While

A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for BEAVER BRAND CAST IRON ENAMEL WARE

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

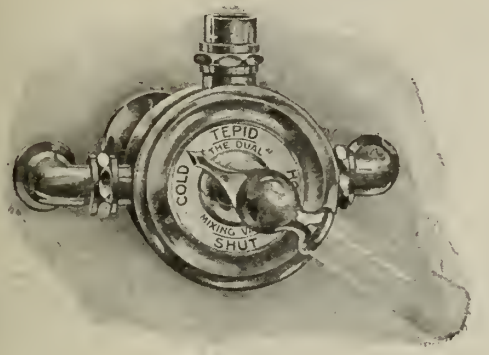
ONTARIO:
Monarch Brass Mfg, Co., 71 Brown St., Toronto

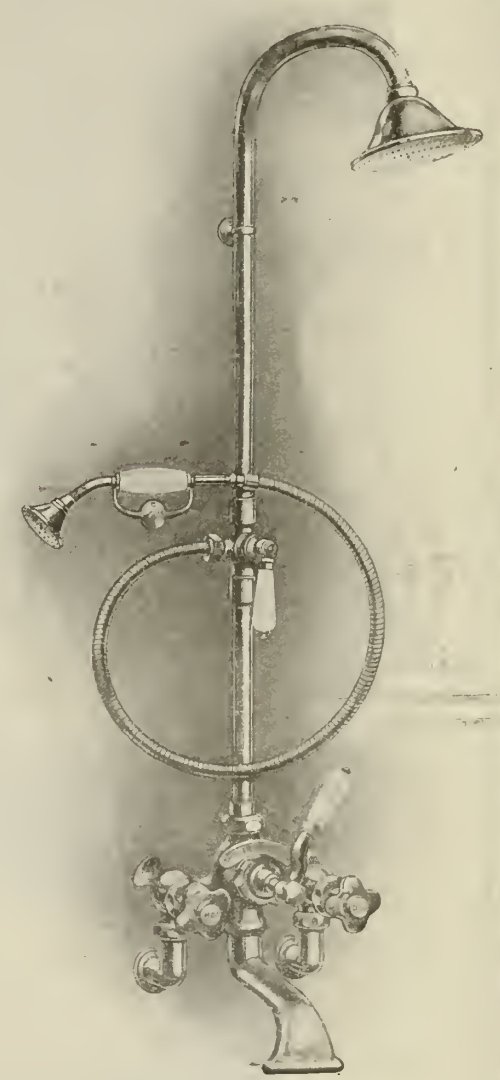
MANITOBA and NORTHWEST:
E. B. Plewes, 120 Lombard St., Winnipeg

G. & W. G. GUMMER, LIMITED

EFFINGHAM BRASS WORKS, ROTHERHAM, ENGLAND

And at
9 Fenchurch St., London





"Dual" Mixer

A valve that really mixes Hot and Cold Water, and maintains a uniform mixture.

For ease of operation, simple construction and easy installation, it has set a new standard of efficiency.

Cold Water must be turned on first, no possibility of scalding.

Made in several forms for Showers, Sprays, Operating Rooms, etc.

At the well-known works of Messrs. Brunner, Mond & Co. these valves provide baths for 2,500 employees.

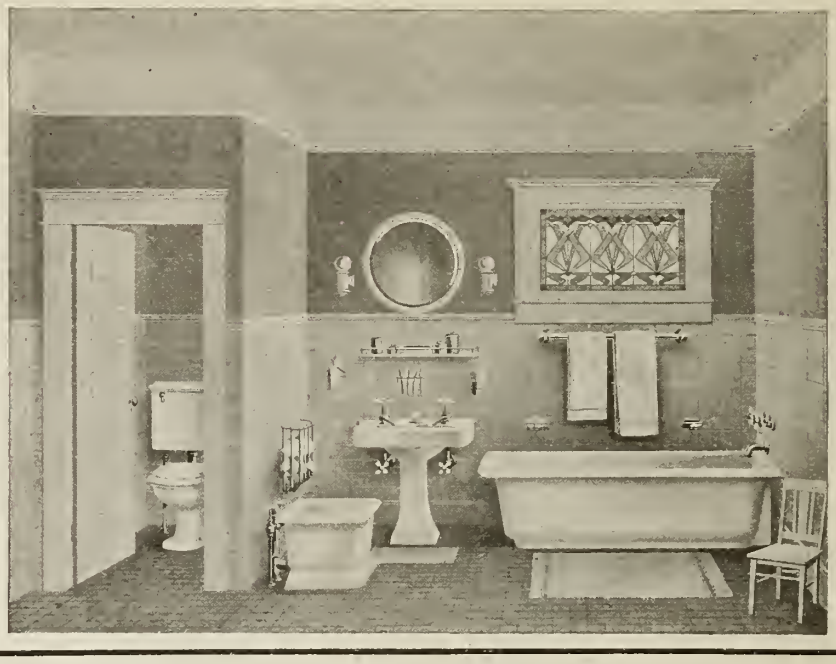
G. & W. G. GUMMER, LIMITED

Manufacturers of every description of

Engineers,' Plumbers' and Sanitary Quality Brassware

Make your plans for coming activity in the building trade

BATHS,
LAVATORIES,
SINKS,
ARISTOCRAT
LAUNDRY
TUBS.



LEAD PIPE,
SHEET LEAD,
SOLDER,
BLOCK LEAD

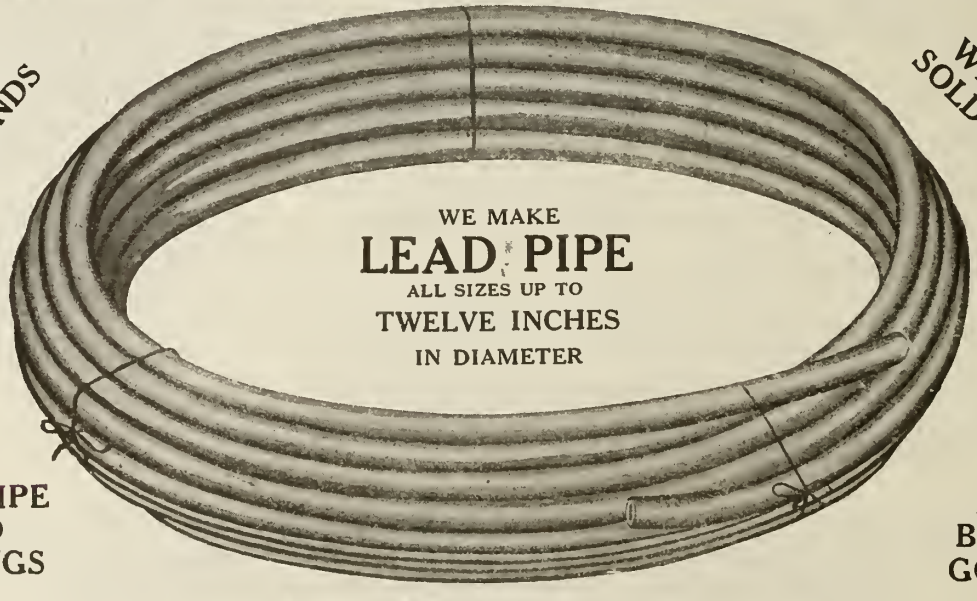
WE HAVE EVERYTHING FOR

THE PLUMBER

CATALOGUE A MAILED FREE

TRAPS AND BENDS

EASY WIPING SOLDER



WE MAKE
LEAD PIPE
ALL SIZES UP TO
TWELVE INCHES
IN DIAMETER

IRON PIPE AND FITTINGS

ALL BRASS GOODS

THE CANADA METAL CO., Limited

TORONTO, CANADA

HAMILTON MONTREAL WINNIPEG VANCOUVER

"Standard"
"Perfection" Built-In Baths

Made in One Piece Enamelled All Over

These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners meaning bathroom sanitation.

Made in 5 and 5½ foot sizes.

Illustrations on request.

Write the nearest dealer

Standard Sanitary Mfg. Co.
Limited

General Office and Factory, Royce and Lansdowne Aves., Toronto, Ontario

Toronto Store:
55-59 Richmond Street East

Winnipeg Showrooms:
76 Lombard Street

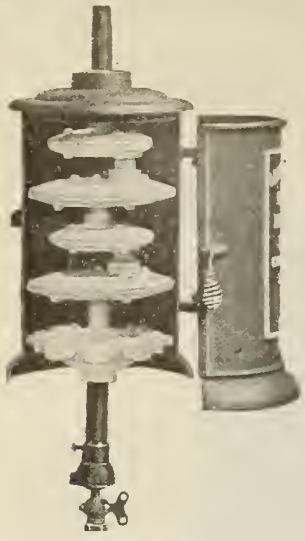
Hamilton Store:
20-28 Jackson Street West

Montreal:
4 Beaver Hall Square

Calgary:
31 Canada Life Building

Vancouver:
847 Beatty Street

"MADE IN CANADA"



The Completed Imperial Water Heater

We Put Good Money Within Your Grasp

Sectional View Showing Water Flow

when we put the Imperial Gas Water Heaters on the market.
They are undoubtedly the most economical on gas of any other make. They are not only easy on gas, but with the perfect circulation they

"HEAT WATER IN A JIFFY"

GOODWIN & COMPANY, Limited

Sarnia, Ontario, Canada

WE TAKE ALL THE RISK
—*YOU TAKE THE PROFIT*

AND YOU CUSTOMERS PROCURE REAL SERVICE FROM EVERY POUND OF COAL CONSUMED

Don't think for a moment that our appliances are for steam installations only. We manufacture appliances to control the temperature of water under any condition. We have goods to control the temperature in rooms or buildings, no matter what the size may be. We can show you how to control the temperature of an ice-house to a hot-house, and no job is too large or too small.

You can make more profits and save coal by consulting us about your next heating job. Write us for literature and watch our advertisments.

Canadian Powers Regulator Company, Ltd.

115 Bay St. . - Toronto

Coil Furnaces

With Safety Valve and Bulb

And

With Air Pump

Furnace Repairs

Why Not

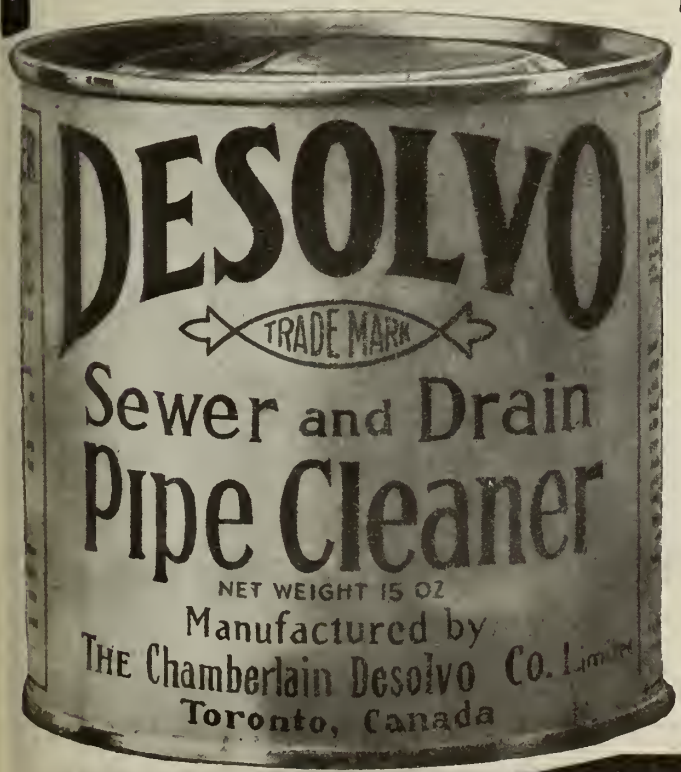
Prepare for the Spring Trade?

Write for Late Discounts

Canadian Wolverine Co., Limited

Chatham, Ontario

DESOLVO IS A WINNER



You'll Be Strong For Desolvo—

If you just give it a trial! Desolvo and cold water will clean pipes and drains *quicker* and *cheaper* than you can do it in any other way.

Write out a trial order and mail it to your jobber. You will not regret it.

THE CHAMBERLAIN DESOLVO CO. LIMITED

110 Church St., Toronto

General Offices - - - PITTSBURG, PA.

PLUMBERS Trade K–A–T–IE Mark BUILDERS

GALT Supplies ONT.

GREY-CASTINGS-IRON

STANDARD

Our Soil Pipes and Fittings are of PLEASING design and perfect workmanship, and our range covers all the modern fittings of Caulked and Threaded Joints.

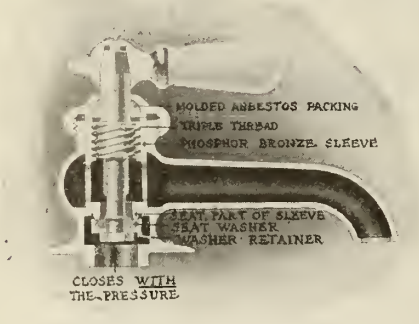
SPECIAL

Our K-T Range Boiler Stands, Sink Brackets, Tub Stands are good. Our Roof Fillings, Threaded Tees, Y's and Specified Threadings are Tapped Straight with full Threads.

THE KATIE FOUNDRY

GALT - ONTARIO

"Quaturn" is the Faucet



Exclusive Features
(Patented)

Look at this feature.

On the ordinary Bibbs the seat is part of the body. On the Quaturn the seat is made by the phosphor bronze sleeve.

Do you see the advantage?

On the old Bibb if the seat goes, the Bibb goes. On the Quaturn if the seat wears a new one may be put in at small expense and the Bibb is as good as ever.

We would like to tell you more about the Quaturn. If you will just drop a line or telephone our nearest office you will have all these features at once.

The WALLACEBURG BRASS & IRON MANUFACTURING COMPANY, Limited

WALLACEBURG, ONT.

HEAD OFFICE

Toronto: Mr. L. N. Vanstone, 10 Wellington Street E.

Winnipeg: Moncrieff & Endress, Ltd., Galt Bldg.

Montreal: J. R. Devereux & Co., 358 Beaver Hall Sq.

Pipe Fittings

Made in Canada

The Brand that has the Quality

M Brand Pipe Fittings, etc., give a service and satisfaction that will invariably get you re-orders and much new business as well.

A trial of the goods will prove this claim.

CAST IRON FITTINGS

With this brand mean fittings made with iron of high tensile strength—proper proportions and correct tappings.

RECESSED DRAINAGE FITTINGS

MALLEABLE FITTINGS

With this brand mean fittings made of Air Furnace Refined Iron, reamed and tapped to gauge with perfect threads.

Standard and Extra Heavy Flanged Fittings and Flanges. Galvanizing Malleable and Gray Iron Castings of all Kinds.

International Malleable Iron Co., Limited, Guelph, Ontario, Canada

WE SPECIALIZE IN

PIPE THREADING TOOLS

Take Another Look At This Job

ESTABLISH PEACE

If you desire to establish lasting peace in your shop, you will have to furnish your men with good tools. Men will not do the same amount of work if that work is hard. The more you *INVEST* in tools if they're good tools, the less you will SPEND in labor. To invest is to establish an asset, to spend is to create a liability. Our tools will save you money and make peace in your shop.

ESTABLISH PROFIT

Work made easy becomes a pleasure. Jardine and Toledo Pipe Threading Tools make threading pipe so easy that a boy can thread a 4-inch pipe as easy as he can thread a ½-inch pipe.

Not only so but when a thread is made with one of our tools it's a good thread. No cutting off pieces of pipe. No lost time and no leaks. That's the way to establish a profit on every job.

A. B. JARDINE & COMPANY, LIMITED, HESPELER, ONT.

Sole makers of "Jardine" Pipe-Threading Tools.
Sole licensees to manufacture and sell Toledo Pipe-Threading Tools in Canada.
Agents, Winnipeg and West—Stanley Brock, Ltd., Winnipeg, Man.
Brockville and East—J. R. Devereux, 358 Beaver Hall Square, Montreal.
Belleville and West—W. H. Cunningham & Co., 183 Church St., Toronto, Ont.

Becoming a Bigger Man

WHAT is the difference between some men you know and others known to you? Why are some men earning $3,000 a year and some $30,000? You can't put it down to heredity or better early opportunities, or even better education. What, then, is the explanation of the stagnation of some men and the elevation and progress of others?

We are reminded of a story. A railroad man, born in Canada, was revisiting his home town on the St. Lawrence River. He wandered up to a group of old-timers who sat in the sun basking in blissful idleness. "Charlie," said one of the old men, "they tell me you are getting $20,000 a year," "Something like that," said Charlie. "Well, all I've got to say, Charlie, is that you're not worth it."

A salary of $20,000 a year to these do-nothing men was incredible. Not one of the group had ever made as much as $2,000 a year, and each man in the company felt that he was a mighty good man.

Charlie had left the old home town when he was a lad. He had got into the mill of bigger things. He developed to be a good man, a better man, the best man for certain work. His specialized education, joined to his own energy and labor sent him up, up, up. To put it in another way: Charlie had always more to sell, and the world wanted his merchandise—brain, skill and ability. Having more to sell all the time, he got more pay all the time.

Charlie could have stayed in the old home town; could have stagnated like others; could have been content with common wages. In short, Charlie could have stayed with the common crowd at the foot of the ladder. But Charlie improved himself and pushed himself, and this type of man the Goddess of Fortune likes to take by the hand and lead onward and upward. Almost any man can climb higher if he really wants to try. None but himself will hold him back. As a matter of fact, the world applauds and helps those who try to climb the ladder that reaches towards the stars.

The bank manager in an obscure branch in a village can get out of that bank surely and swiftly, if he makes it clear to his superiors that he is ready for larger service and a larger sphere. The humble retailer can burst the walls of his small store, just as Timothy Eaton did, if he gets the right idea and follows it. It is not a matter of brain or education so much as of purpose joined to energy and labor. The salesman or manager or bookkeeper or secretary can lift himself to a higher plane of service and rewards if he prepares himself diligently for larger work and pay. The small manufacturer, the company director, the broker—all can become enlarged in the nature of their enterprise and in the amount of their income—by resolutely setting themselves about the task of growing to be bigger-minded men.

Specialized information is the great idea. This is what the world pays handsomely for. And to acquire specialized information is really a simple matter, calling for the purposeful and faithful use of time. This chiefly.

One does not have to stop his ordinary work, or go to a university, or to any school. One can acquire the specialized information in the margin of time which is his own—in the after-hours of business. Which means: If a man will read the right kind of books or publications, and make himself a serious student at home, in his hours—the evening hours or the early morning hours—he can climb to heights of position and pay that will dazzle the inert comrades of his youth or day's work.

IF business—BUSINESS—is your chosen field of work, we counsel you to read each week THE FINANCIAL POST. It will stimulate you mentally. It will challenge you to further studious effort. It will give you glimpses into the world of endeavor occupied by the captains of industry and finance. With the guidance of the POST, and with its wealth of specialized information, you, a purposeful man, aiming to go higher in life and pay, will find yourself becoming enlarged in knowledge and ambition, and will be acquiring the bases and facts of knowledge which become the rungs of the ladder you climb by.

It is the first step which costs. But this cost is trivial—a single dollar. We offer you the POST for four months for a dollar. Surely it is worth a dollar to discover how right we are in our argument. If you have the will to go higher in position and pay, sign the coupon below.

THE MACLEAN PUBLISHING COMPANY, LIMITED,
—143-153 University Avenue, Toronto.

Send me / us THE FINANCIAL POST for four months for one dollar.

Money to be enclosed / remitted

Signed .....

S.E. .....

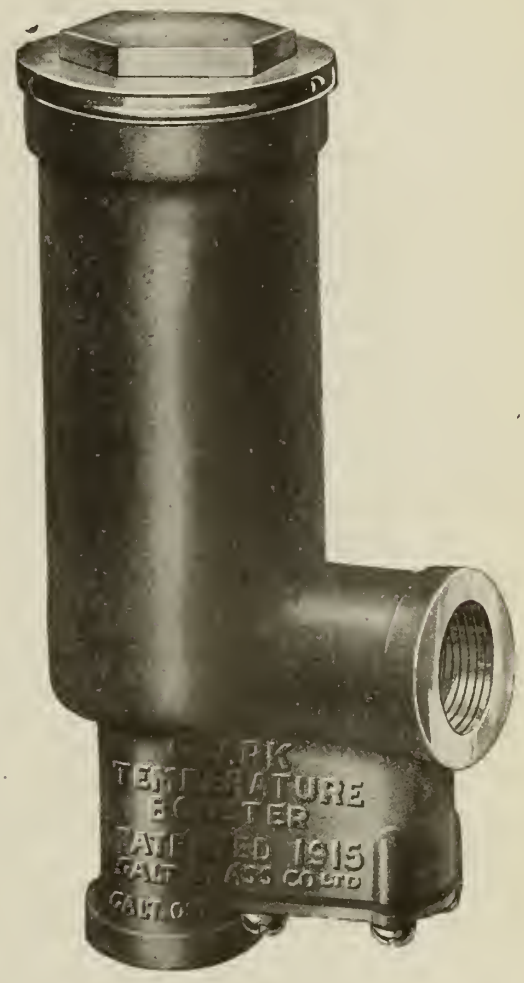
Clark Temperature Boosters

Actually Save Piping and Fittings!

SIMPLE TO INSTALL

TO be able to cut down the size of piping and fittings these days will help you considerably in the way of extra profits on work done! Or to look at it from an entirely different point of view, you are actually losing money if you do not fit a Clark Temperature Booster on every job.

You conserve material and also assist in saving coal, to the extent of 15 per cent.



Here's an example. A house requiring 10 tons of coal to heat it during a winter season will only burn 8½ tons and procure greater comfort from the fuel burned.

Write Us or Write Your Jobber

GALT BRASS CO., LIMITED

GALT :-: CANADA

Building Business During 1918

An Agency making a specialty of collecting building statistics reports that in the year 1918, there were buildings erected in Canada for residential, commercial and industrial purposes, to the value of about $97,000,000.00.

The thirty-five cities which issue building permits and make reports, account for about $36,000,000.00 of the same class of buildings in their territory, leaving a balance of $61,000,000.00 to be distributed over Canada in those sections of the country where no records or statistics are kept.

We call attention to this fact, as it shows the wonderful opportunities there are for Sanitary Engineers and those engaged in the Plumbing business, in localities which are not immediately supplied with sewerage or water systems. Every one of these buildings, whether it is a residence, warehouse or factory, could be and would be better for having sanitary appliances, and we believe that everyone of them would have these conveniences if they knew how easily they were obtained, and how small the cost would be in comparison with the total value of the building.

The PORT HOPE SANITARY MFG. CO., LIMITED, would like to develop this class of work, and assist the Sanitary Engineer or the Plumbers. The policy of the Company is to have its goods installed by the regular Master Plumber, as we know that fixtures properly installed have an added value and give greater service.

For this reason we distribute our goods through the recognized channels, that is through the regular Jobbing Houses, and have them installed by the regular or skilled Master Plumber. The Company is willing and anxious to do whatever is possible to promote and develop this class of business, and will gladly co-operate with either supply houses or Master Plumbers in the way of furnishing literature, cuts, illustrations and printed descriptions of the very excellent line of Plumber's Sanitary Ware which we manufacture in our Factory at Port Hope.

This is the time for all who are interested to get together and make a bigger and better business for the year 1919.

Port Hope Sanitary Mfg. Company, Limited

Factory:
PORT HOPE, ONTARIO

Head Office:
ROYAL BANK BUILDING, TORONTO

TORONTO SHOWROOMS
119 King St. East

WINNIPEG OFFICE
405 Tribune Bldg.

MONTREAL SHOWROOMS
234 Beaver Hall Hill

HALIFAX OFFICE: 58 Bedford Row

SANITARY ENGINEER

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Technical Education Necessary

Washington Government Sending Out Some Very Interesting Bulletins—What is Canada Doing?—Employer and Employee Both Must Co-operate if Export Trade is to be Encouraged or Home Markets Sustained

AMONG the many bulletins being published and issued by the Federal Board of Vocational Education one stands out away ahead of them all. We refer to Bulletin No. 20, Series 4, entitled "Buildings and Equipment for Schools and Classes in Trade and Industrial Subjects."

It is illustrated and contains some very valuable information for all who take an interest in technical education. For example, in discussing the need for industrial school buildings, it says: "The rapid growth of industrial schools is a development of the educational system designed to meet the demand in the industries for more skilled workmen, foremen and superintendents.

"The situation is rapidly becoming serious and must be met by a system of industrial training which will supply the ever-increasing demand of industry for intelligent man power. To meet this demand trade and industrial school are needed. Pupils must be given such experience and trade training as will fit them to enter successfully upon industrial employment. This education requires a new type of school building."

It will be seen by the above that it is becoming more apparent every day that all the training cannot be acquired in one shop, or even in a number of shops. In the plumbing trade, for example, we have our apprentices and journeymen, who are being taught just that quantity and quality of ways and means of doing work that comes within the scope of the particular shop in which these persons labor.

Just to cite one of the many examples which came to the writer's notice recently, a reader of SANITARY ENGINEER writes as follows: "Can you tell me what book or books I can procure which will show me how the various heating systems are installed, **and why certain methods are adopted? I know how to install quite a number of styles of heating systems. But I do not know why I install them in the way I do. I want to know the why.**"

There is the whole question in a nutshell. In connection with the plumbing business how many know the *why* of the practices followed in their every day work? And to be really honest about it, should we expect that the employer do all the training? Most decidedly not. The whole problem resolves itself down to this —that the more efficient a workman is the greater service the public receives. Then in all fairness the public should pay the piper by supporting technical schools either through the federal, provincial, or municipal governments. The writer would favor the Federal Government being the one to foot the bill for many reasons. Take for example the Toronto Technical School. There are pupils attending this school from all over the Dominion, if reports are true, and Toronto pays the bill, while the whole of the Dominion benefits.

Reverting back to the bulletin in mind, we will quote from another chapter under heading of "The Problem and Type of Equipment."

How Much Equipment Is Needed?

"If the pupil is to be fitted to meet the demands of industry, his training must be real. If it is real, it must be given in a shop making things on a useful or productive basis. Schools giving training in such subjects as wood-working, metal working, electrical work, etc., can readily find use for the work of the pupils, either in the building itself or in the school system. Every school should make a part of its own equipment.

The Factory Type of Industrial School

"The construction of the factory type must be of such a character as to provide a large amount of light. Extra light may be obtained by means of northern saw-toothed skylights, and thus avoid the glare of the direct sunlight. Windows should be planned to occupy as much of the exterior wall space as the construction and architecture of the building will permit. It is desirable that the windows be of factory construction with small panes, so that accidental breakage will not cause large expense for replacement. In the construction of the floors, a knowledge of the purpose for which the room is to be used is necessary.

"Each individual trade should be considered from standpoint of its necessities under commercial conditions, and the plan made to provide necessary floor space, light, door openings for admission of large work, and freight elevator service.

"Architects should not specify cement floors for shops in which edged tools are used, as it is impossible to avoid dropping tools on the floor. Whenever possible, wooden floors are preferable in such cases. Floors in which heavy machinery is to be installed should be designed to sustain the floor load weight with a sufficient safety factor to support future additions to the equipment. It is not always necessary to plaster interior walls. The roof construction, like the floors, necessitates on the part of the architect a knowledge of the purpose for which the room is to be used. Provisions should be made for numerous inserts in the ceiling and for suspending shaft hangers from steel girders whenever metal-working machinery is to be installed.

"*Ample locker space, wash and toilet rooms should be provided. The requirements for sanitation should be carefully observed. In planning the wash and toilet rooms of the new buildings, a careful study should be made of the flushing systems, and the location should be convenient to the shop rooms. It is not desirable to place wash rooms or toilet rooms in basements where the problems of sanitation are greatly increased.*"

The last paragraph is, or should be, of particular interest to the plumbing trade.

SANITARY ENGINEER has more than once voiced its disapproval of basement lavatory accommodation. But the plan seems to be followed by almost every architect. The wonder is that our residences are not fitted up with basement lavatories (to save room).

It is all a matter of education, and if our next generation of sanitary engineers are given the necessary technical training, not only will basement toilet rooms, but also underground public comfort stations, be things of the past.

Amount of Plumbing Class Equipment

To many small town governing bodies, it is often a question as to what kind of equipment is needed and the supply that would be necessary to install it. In this bulletin one section is set aside for this question.

Suggestion for Plumbing Class Equipment

"In designing a room for plumbing, pro-

vision should be made for more than the average ceiling height. This is necessary in order to provide for the installation of plumbing systems in practice houses of at least two stories and basement. In some cases, schools have arranged for two floors of the building to be given to plumbing, and cut large openings in the floors through which to extend the rough work. In any case, it is necessary to provide 500 to 700 square feet of earth floor space for installing drainage systems in tile and cast iron pipe.

"For a class of 10 to 15 pupils, the equipment should include:

"Three metal-topped tables, tops ¼ by 42 by 96 inches; 12 melting pots with gas burners (or plumbers' furnaces); 2 plumbers' gasoline torches; 1 skeleton of a building for practice work; 5 plumbers' kits; 6 each of 10-inch and 14-inch pipe wrenches; 3 each 18-inch and 24-inch chain tongs; 2 each 24-inch and 36-inch chain tongs; sets of stocks and dies, cutters, and supplies for lead work; a supply of water, gas, and lead pipe, fittings and plumbing fixtures for practice work, including water-closets, urinals, lavatories, sinks, bath tubs, trap vents, and drain and drainage pipes. Value of equipment, $1,000 to $2,500. Annual cost of supplies per pupil, $10 to $15."

Purely a Matter of Education

The writer has just read over a copy of the report of the recent convention held in Ottawa, under the auspices of the Canadian Building Industries. It was a gathering of men from all over the Dominion representing every branch of the building trade, and the sentiment expressed was simply splendid, particularly from those men who represented labor. Senator Gideon Robertson, the new Minister of Labor, told those present that "intensive efficiency will be needed to compete in foreign markets, efficiency on the part of both employees and employers. That efficiency be maintained is desirable from the standpoint of all interests concerned."

Thos. Moore, president of the Trades and Labor Congress of Canada, made some very sane, logical and sound remarks during his address. He said: "It is possible for labor to build up a species of autocracy of capital. If we cast our eye towards Russia, we can see the danger of too quick a relaxation and a too sudden swing of the pendulum without the preliminary education necessary.

"Some sort of legislation is needed to make satisfactory a democratic control of industry. This may be easy to-day in the mining or steel industries, or any other industry which is concentrated, and where the employers are few and the employees are closely gathered in groups or communities." Mr. Moore urged upon the employers present not to adopt too much of a "show me" attitude towards any new ideas of government. If they did they would be very much like the stone mason who was being told by a friend of his that concrete is just as permanent as stone. Replied the stone mason, "Well, friend, all that may be true, but show me the concrete building that has stood up as well and as long as stone." Of course that could not be done. It was an impossible attitude.

This instance and many more, while possibly of a political nature in many ways, are purely matters of education. It is just the same in our plumbing trade. We have too many "show me" employers and journeymen, and such being the case, we should endeavor to have boys trained, morally, physically, mentally and technically, so that they will be endowed with a broader vision on all subjects.

The days of duplication and complication are waning. Men are beginning to see that material and time has been and is being wasted in all industries. And not one whit less in the plumbing and heating trade than in other lines. It is all a matter of education, or lack of it, when we learn of fuel being wasted because heating plants are impractically installed. Not only fuel, but even lives. At the time of writing it is reported that four lives have been sacrificed in Toronto as a result of an improperly installed warm air furnace. No man would wilfully install a furnace in such a way as to be a danger to the occupants of the building if he has procured a proper training. He would be too conscious of the dangers lurking around such an installation. There is far too much tampering and peddling with goods and installations that if improperly constructed are a menace to health, and a waste of material.

We should every one devote more time and energy to this problem of technical education, and see to it that our employers as well as our employees are practical and possess a self-consciousness not to do work merely for price. We should all try and prevail upon our governments to bring into operation some form of Federal educational system that would bring technical education within the reach of all.

FROM PIPES AND BOILERS

Data are derived from experiments made with magnesium covering at the Mellon Institute of Industrial Research As a preliminary it is shown that the usual allowance for bare pipes of three B.Th.U. per degree difference per square foot per hour is erroneous. It is at least 50 per cent. more for 100 degrees difference and much more than this for 500 degrees difference. The experimental apparatus is described, together with methods of measuring the temperature and heat losses.

The results are plotted and show the great saving effected by covering. A formula is obtained:—

$$H = \frac{2K(T_1 - T_2)}{\log_e \frac{R_2}{R_1}}$$

Where:—

H = Heat loss in B.Th.U. per hr. per ft. length of covering.

T_1 = Temperature of surface of pipe in deg. Fahr.

T_2 = Temperature of surface of insulation in deg. Fahr.

R_1 = Radius of pipe in in.

R_2 = Outer radius of insulation in in.

K = Conductivity of the insulating material in B.Th.U. per sq. ft. of cross-section per in. thickness per deg. Fahr. temperature difference per hr.

The effect of wind was tested by means of a blower, and a wind of 30 miles per hour increased the loss from 0.302 B.Th.U. to 0.430 B.Th.U. per sq. ft of pipe surface per degree Fahr. temperature difference.

A series of curves are given showing the losses for temperatures varying from 100 to 600 deg. Fahr., and for thicknesses of covering from 0 to 5 in. From this series of curves the cost of steam for load factors varying from 20 to 80 per cent. for flat surfaces and round surfaces down to ¾-in. drain is obtained, which gives the proper thickness of covering to effect the minimum annual cost. These curves were confirmed by means of special experiments with a locomotive type boiler, first bare and then covered.

PLUMBER—A WORKER IN PLUMBUM

How many of us are there who know what a plumber is? or why he is called a plumber? Be it remembered that gas pipe fitters and steam pipe fitters, etc., are not plumbers. A plumber is a man who works in lead fixtures, doing such work as soldering lead pipe, etc. Iron pipe may be crowding in on the lead pipe to a certain extent, but that kind of work in simply pipe fitting. Plumbing properly appertains to lead and nothing else. Now lead is only a nickname. The proper name for this metal is "plumbum," and its chemical symbol is always Pb., and the workers in lead or plumbum were formerly known as "Plumbummers"; but here again a nickname or abbreviation has been worked in, with the result that the name has been haggled down to where it now is. There is no nobler profession than that of plumbumming, and it is about time that people would learn to talk the language correctly and give to these workers their proper name, to which they are justly entitled.—"Canadian Foundryman."

MAINTAINING HIGH VACUUM IN STEAM CONDENSERS

High-class condenser packing should be permanent; it should fill every crevice and be able to resist alkalis, acids, and salts in solution. There may be as many as 12,000 tubes (24,000 packings) in a single condenser. Cotton wick, coarse lace and fibre rings deteriorate when exposed to steam, air, oil and heat; their life is only about 1 year. Air leaks are often overlooked at the low-pressure cylinder valve and piston rod stuffing-boxes. A pine stick torch is useful in finding leaks at any point in the condenser or low-pressure pipe system.

Our Duty to Our Wounded Soldiers

The Clang of Battle is Over—Shedding of Blood Has Ceased—Shouting Should Be Over—Getting Down to Real Business the Duty of Every Man—We Want Soldiers of Peace and Progressive Industry

By THOMAS STANSFIELD

FROM time to time articles have appeared in SANITARY ENGINEER bearing upon the subject of our duty to returned soldiers. Quite a while ago I recall one article that voiced the opinion that almost every trade could, if properly organized, take care of its own trained wounded soldiers; men who, previous to the war, had been engaged in the sanitary and heating business.

Upon making inquiries I do not find that the sanitary and heating trade have done anything out of the ordinary for their returned men who have been incapacitated, and who can no longer work at the trade as in the days before they heard the call to arms to fight for democracy.

There is, however, some consolation in learning that here and there all over Canada, men have procured positions as inspectors of plumbing, thereby being able to use their brains and good practical experience for the benefit of the community from which they enlisted. But how about some real organized efforts on the part of, say the Canadian Institute of Sanitary Engineers, or the Canadian Society of Domestic Sanitary and Heating Engineers?

Possibly these organizations have felt that the problem was one to be dealt with and solved by the Dominion Government. And if such is the case, I think it would not be out of place to reprint the New Year's message from Mr. H. J. Daly, Director of the Repatriation Committee of the Dominion Government. This message is more than a message, it is a S.O.S. appeal to the intelligence of every Canadian. It speaks the truth and shows that every man, every member of any or every organization, should do something on his own behalf, or hold himself in readiness to help in any way possible to absorb the returned men into industry in the most natural way. This is what Mr. Daly says:

THE RESPONSIBILITIES OF PEACE

"The fight is over—yes, but not the war. The war will be over when those who went in Canada's name to fight the battles of democracy are so re-established in the land of their birth, or of adoption, as to be able to enjoy the fruits of democracy, and when the damage wrought to humanity by the war has been repaired to the utmost of human capacity.

"In order properly to discharge this debt it is necessary for every man, woman and child of the age of reason, to understand the cause of the war, to appreciate the extent of human sacrifices involved, to realize the benefits arising out of the war and fully and constantly to recognize their obligations to their fellow men.

"Such an understanding cannot be imparted by anyone at a governmental agency. It requires the individual effort just as winning the war required individual effort. It furthermore requires the effort of every medium or organization that has to do with the social and economic betterment of all the people. Therefore, in our efforts to readjust conditions to a better basis we want the assistance of religious, social, fraternal, business, educational and all other classes of organizations. We want them to help as freely now as they did during the war—even going to the extent of submitting to direction when same is necessary. Such organizations are the agencies to create a community atmosphere of contentment; and they were never so much needed as they are to-day."

The above message has the right ring to it. It is a call to arms of every industry to absorb as far as possible those men who can perform some branch of the trade they have learned. Their training cost them and the trade something previous to the war, and there can be no logical reason why their skill cannot be put to some use.

In the first place the secretary of every association should procure a list of all journeyman plumbers or fitters and ascertain their physical condition as well as their practical experience, and then positions should be found them as bookkeepers, foremen, inspectors, etc.

In the case of positions as plumbing inspectors, some provisions would have to be made; for example, every district, whether an incorporated township, village, town or city should have some by-law governing the installation of plumbing and heating, etc. Every province has its health department, and every province should have in operation a plumbing by-law. Then there should be provincial plumbing inspectors in unorganized districts. These provincial inspectors could supervise the plumbing installed in country homes, working under authority of the local health department. Or, where a town or village was not big enough to support a plumbing inspector, his salary should be paid out of the taxes levied by the province.

Just a few days ago I had a case put up to me where certain sanitary inspectors in Regina were condemning the use of septic tanks and were in favor of installing cesspools. Such men have no right, honorably, to be appointed to such positions. They do not know the first principles or laws of biology or they would never take exception to septic tanks. But men who have had previous experience in installing small sewage plants, plumbing and heating, etc., and pneumatic water systems, men who have been to the war and come back maimed, these should be placed in such positions as would enable them to use their previous experience for the public's benefit.

Canadians owe a solemn debt, a debt beyond repayment, to the men of their Expeditionary Force, who, let us never forget, placed themselves between us and the German host. But if our obligation to them can never be discharged in full, our simple duty as their fellow citizens will not be accomplished until the last man to leave the army has been re-established in our national life. He must be given a chance to re-discover himself in a world that will be strangely new.

There is, perhaps a danger in the demonstration of welcome that meets the returning soldier. The brass band, the cheering and the speeches are right and fitting in their proper place, but these we must follow up with patient, determined effort to help the homecomer find his feet and become a citizen again. Government machinery, however effective, and however extensive, can only work in an atmosphere of co-operation. Co-operation is the oil which keeps the machinery running. Let no man criticize who will not help.

Demobilization is a misleading word. It suggests undoing, the scrapping or the putting away of a machine. We are really putting nothing away; on the contrary the resources, human and material, which we organized to win a war, must again be concentrated on the tremendous effort of restoration, readjustment, reconstruction—three R's as fundamentally important as the three R's of our school days. We are not reverting to a pre-war condition. "Back to mufti" is perhaps a misleading phrase. We are not going back; we are going forward, and with the stimulus of a new purpose. The need for action is now as urgent as it ever was, for we are not demobilizing—we are mobilizing for peace.

In conclusion, allow me to state that if ever the craft had an opportunity to get a hearing from the Government, it has one now. The whole trade from coast to coast should be willing to act in a concerted way to lay a plan before the Canadian Government, showing the need for standardization of plumbing goods, of plumbing by-laws, and of proper Dominion-wide plumbing inspection. Then we could give practical positions to men of our craft whose previous training makes them capable servants.

We must look back to those men on the battlefield. We must realize that they never shirked, never questioned when duty called, and now that it is our turn we too must do all in our power to make a useful citizen of every soldier man, whether married or not. Not in a charitable way do these men want assistance, but to go on doing their bit according to their abilities. If we need any spurring on we have only to realize the great moral fibre of our Canadians. One has only to think of the half million men who were prepared to give their all for the sake of an ideal, and this is where lies our example for the years to come. Our Canadian boys had a job to do. They finished it magnificently. We

the "roughing in" as soon as we can. As an army of reconstruction we can follow up the work these men, on their part, "finished" in their endeavor to make this world a better place to live in.

As an army of reconstruction we can follow up their work; make good their gains. Only as a united army of reconstruction can we carry the country over the difficult road from war to peace. That is our duty to our wounded soldiers.

TOPICS OF INTEREST

LOSS OF HEAT IN CHIMNEYS

The growing need for economy in fuel makes the following description and estimation of the loss of heat in chimneys both interesting and useful.

By far the largest part of the chimney loss is heat held by the gases because of the high temperature at which they leave the boiler. This part of the loss is unduly large when too much air enters the furnace and the boiler setting; it can be greatly reduced by decreasing the air and by lowering the temperature of the gases leaving the boiler. To burn 1 pound of coal requires about 14 pounds of air. This air enters the furnace at atmospheric temperature, and leaves the boiler at a temperature about 500° F. higher. It carries with it all the heat it absorbed in being heated through this temperature range of 500 degrees. Each pound of air absorbs approximately one-fourth of a heat unit (B.T.U.) for each degree of temperature rise. Therefore, each pound of air, in being heated 500 degrees, absorbs

$$\frac{500}{4} = 125 \text{ heat units.}$$

14 pounds of air absorbs $14 \times 125 = 1{,}750$ heat units. If, instead of 14 pounds of air being admitted for each pound of coal fired, 28 pounds is admitted into the furnace, the heat carried away by this weight of air will be $28 \times 125 = 3{,}500$ heat units, or twice as much as in the furnace using 14 pounds. Again, if the gases should leave the boiler at a temperature 1,000 degrees higher than atmospheric they would carry away twice as much heat as gases heated to only 500 degrees, and 1 pound of gas would carry away

$$\frac{1000}{4} = 250 \text{ heat units}$$

Therefore, the amount of heat carried away by the flue gases depends directly upon the weight of air entering the furnace and the temperature rise. Air entering the furnace in excess of about 14 pounds to a pound of coal burned is not necessary to good combustion, and the heat it carries away when leaving the boiler is wasted.

The chimney loss also includes the heat units in the unburned combustible gas and in the visible smoke. This part of the loss is due to the lack of enough air at the right time and place to burn the gases completely. Thus one part of the chimney loss is due to excessive supply, and the other part to insufficient supply of air. Hence, there is always the possibility that by reducing the one part of the loss we may increase the other part. However, in the average plant the loss from excess air supplied to the furnace is far larger than the loss from incomplete combustion, and the sum of the two can be greatly reduced by decreasing the excess of air. In many plants both parts of the chimney loss can be reduced by more careful firing.—(U. S. Bureau of Mines).

CENTRALIZED INSTRUMENTS IN BOILER ROOMS

It is suggested that an operator's desk or bench-board will soon form a feature of modern boiler room equipment. Instruments on the board will give the operator a complete operating analysis of conditions existing in the furnaces and boilers, and the greater part of the work will be handled automatically. Portable instruments have their uses, but permanent and centralized instruments are needed to give operators full control over the rapidly varying conditions encountered in the average plant.

SLIDE VALVES IN PLACE OF STOP VALVES

Stop valves are now being largely replaced by slide valves, especially in connection with turbine work. In small stations the change has already been made, chiefly because of the large dimensions of the valves and the high velocity of the steam.

In marine engines the change has not been so marked owing to the unreliability of the slide valve, especially for superheated steam.

Disadvantages in the construction of the slide valve are the uneven wearing of the bearing surfaces and liability of the spindle to fracture owing to jamming caused by uneven expansion.

The article describes and illustrates a slide valve by Claassen, which is said to do away with all these disadvantages and can be used even for superheated steam.

NEW COMFORT STATION FOR PARK DISCUSSED

At the inaugural meeting of the Waterloo Park Board held recently, the question of erecting new comfort stations at the park were discussed and it was decided to have a committee of the Board interview the Finance Committee of the Council and ask for a grant of $1,500 or $2,000 to help defray the cost of the work. If the Council does not consent to this it is likely debentures will be issued.

WATER-HAMMER IN MAINS UNDER PRESSURE

The article by the Comte de Sparre, professor at Lyons, says that the arrangements that are frequently employed to cope with the effects of water-hammer such as equilibrium pipes, air vessels, valves or buffers which open a supplementary orifice for the escape of the water should fulfil certain conditions if they are to give the best results. The author subsequently applies the results obtained by calculation to the special cases of buffers or shock absorbers and of vertical overflow pipes. In another article he hopes to deal with their application to relief pipes which do not overflow, and also to reservoirs.

The author first considers a pipe furnished with one of the arrangements alluded to above, and applies the theory of dynamic forces to the water contained in the pipe between a section next to the source of the water and another section near the outfall. This is taken from an instant when the water is flowing in its ordinary course with the velocity v_0 up to a final instant when the velocity of the water at all the points in the pipe considered are again the same and equal to v. He then discusses this by the aid of the calculus and offers equations representing the conditions. Going further into detail he takes account of the elasticity of the water and of the pipe in the case of a shock-absorber which opens a relief valve when the force of the water-hammer attains a given amount. Formulae are given for application in such cases.

COMBUSTION OF COAL ON FURNACE GRATES

In a hand-fired furnace about one-half of the combustion takes place in the fuel-bed and one-half in the combustion space. The burning fuel-bed acts principally as a gas-producer and a gas-retort; in it the solid fuel is gasified by the partial combustion of the fixed carbon, and by the distillation of the volatile matter. The gases rising from the fuel-bed contain at times as much as 32 per cent. combustible, and no free oxygen to burn it. Hence, to burn these gases, air must be admitted over the fuel-bed and mixed with the combustible. and the mixture burned in the combustion space. The oxygen flowing up through the grate is all used as it passes through the first three or four inches of the fuel-bed. The products of combustion in this part of the fuel-bed are largely CO_2, and a smaller percentage of CO. At a height of three to four inches from the grate the CO_2 content of the gases reaches a maximum of 12 to 18 per cent. As the CO_2 passes through the upper layers of the fuel-bed it is reduced by contact with the hot coal to CO, which, with the combustible gases distilled near the surface of the fuel-bed, constitutes 16 to 20 per cent. of the gases rising from the fuel-bed.

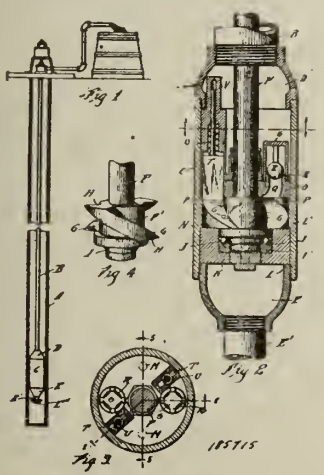
New Canadian Patents

No. 185,715.

Walter R. Woodford, Cleveland Heights, assignee of Samuel Lippert, East Cleveland, both in Ohio, U.S.A., 23rd July, 1918; 6 years. Filed 27th June, 1917. Receipt No. 231,439.

Claim.—1. In a pump, the combination of a cylindrical pump chamber provided with induction ports leading into the bottom thereof, and with eduction ports leading from the top thereof, a vertically extending pump tube whereinto the eduction ports are adapted to discharge, check valves for the eduction port and adapted to relieve the pump chamber from the pressure of the liquid in the tube thereabove, rotary helical vanes in said chamber corresponding to said eduction ports, said vanes being circumferentially spaced, blades slidably mounted in the top of the said chamber adjacent to said eduction ports and adapted to be elevated by said vanes, means for projecting said blades downwardly to the bottom of said chamber when released by said vanes, and means for rotating said vanes.

2. In a pump, the combination of a cylindrical pump chamber provided with induction ports leading into one end thereof and with eduction ports leading from the other end thereof, a vertically extending pump tube communicating with the eduction ports, check valves controlling the eduction ports and adapted to relieve the pump chamber from the pressure of the liquid in the tube thereabove, rotary helical vanes in said chamber corresponding to said eduction ports, said vanes being circumferentially spaced, blades slidably mounted in guideways in the delivery end of the pump chamber adjacent to the eduction ports, tubular extensions for said guideways, springs in said extensions tending to thrust the blades toward the induction end of the pump chamber, and means for rotating said vanes.



No. 185,715. Pump.

3. In a pump, the combination of a cylindrical pump chamber provided with induction ports leading into one end thereof and with eduction ports leading from the other end thereof, a vertically extending pump tube communicating with the eduction ports, means for relieving the pump chamber from the pressure of the liquid in the tube thereabove, rotary helical vanes in said chamber corresponding to said eduction ports, said vanes being circumferentially spaced, blades slidably mounted in the delivery end of the pump chamber, means for moving the blades toward the induction end of the pump chamber, and means for rotating said vanes.

No. 185,640

William S. Mills, Florence, South Carolina, U.S.A., 23rd July, 1918; 6 years. Filed 12th April, 1918. Receipt No. 293,538.

Claim.—1. A grease trap of the character described, comprising an exterior imperforate casing closed at one end and having a cover at the other end and having an inlet opening adjacent last-named end of the casing, and an outlet opening adjacent the other end of the casing, and a grease strainer having an imperforate portion formed with an opening adapted to register with the inlet opening of the casing and with a wire gauze portion, the strainer fitting the interior of the casing.

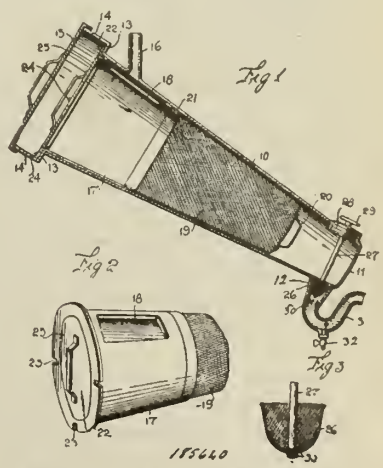
2. A grease trap of the character described, an outer casing tapered longitudinally and downwardly inclined and closed at its smaller end, a cover for closing the upper end of the casing, an outlet pipe leading from the small end of the casing, an inlet pipe leading into the side of the casing adjacent the large end thereof, and a strainer disposed within and fitting the casing having an imperforate portion provided with an opening adapted to register with the opening of the waste pipe and having a portion formed of wire gauze.

3. A grease trap of the character described comprising a tapered outer casing having an outlet at its small end, a cover closing the large end of the casing, the casing being formed with an inlet inward of the cover, a strainer removably disposed within and fitting the casing and having an elongated opening adapted to register with the inlet opening of the casing and means permitting the removal of the casing but holding the casing from rotation and with its inlet opening registering with the inlet opening of the casing.

4. A grease trap of the character deing having an outlet at its small end, a scribed comprising a tapered outer cascover closing the large end of the casing, the casing being formed with an inlet inward of the cover, a strainer movably disposed within and fitting the casing and having an elongated opening adapted to register with the inlet opening of the casing, and means permitting the removal of the casing but holding the casing from rotation and with its inlet opening registering with the inlet opening of the casing, and a cover fitting within the inlet end of the strainer.

5. A grease trap of the character described comprising a downwardly inclined casing tapering toward its lower end and formed at its lower end with an outlet pipe, the upper end of the casing being flanged and then extended upward and having a uniform diameter and being screw-threaded, a closure for the screw-threaded end of the casing, an inlet waste pipe opening into the casing below the flange thereof, and a strainer disposed within the casing comprising a conical body of wire gauze and an annular imperforate body having detachable engagement with the wire gauze body, said imperforate portion being formed with a longitudinally extending inlet opening adapted when the strainer is in place to register with the inlet opening of the casing, said imperforate portion of the strainer being provided with a flange fitting within the flanged portion of the casing, the flange and casing being formed with means permitting the removal of the strainer from the casing but permitting the rotational movement of the strainer.

6. A grease trap of the character described comprising a tapered casing having an outlet extending from its small end, the casing being closed at its small end, a cover for the large end of the casing, an inlet pipe leading into the casing adjacent its large end, a strainer removably disposed within the casing and into which the inlet pipe discharges, an auxiliary strainer seating in the inlet pipe at its junction with the casing, a plug having screw-threaded engagement



No. 185,640. Grease Trap.

with the wall of the casing opposite the inlet pipe, and a rod extending from said plug and connected to the auxiliary strainer.

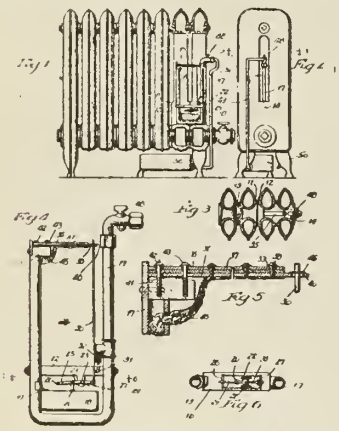
No. 185,467

Frederick Lindmeier and Justus Lindmeier, co-inventors, both of Oak Park, Illinois, U.S.A., 16th July, 1918; 6 years. Filed 23rd November, 1917. Receipt No. 287,951.

Claim.—1. A humidifier system comprising a tank associated with a radiator, a connection for carrying water from the heating coils of the radiator to said tank, a valve controlling the flow of water through said connection, a float controlling said valve to maintain a substantially constant level of water in said tanks, and a hygrostatic element for preventing the ingress of water when the atmosphere is already sufficiently humid.

2. In a humidifier system the combination with a radiator of a tank associated therewith, a float in said tank, a valve controlled by said float, a hygrostatic element for preventing the opening of said valve when the atmosphere is already humid, and a pipe leading to said valve from a source of water supply.

3. In a humidifier system the combination with a radiator of a water tank associated therewith, a water pipe connecting with the heating elements of the radiator, a valve in said pipe, a means controlling the ingress of water through said valve to prevent the flow of water there through when the atmosphere is already humid.



No. 185,467. Humidifier.

4. The combination with a heating system of means for humidifying the air heated by said system, comprising a water tank, a valve controlling the supply of water to said tank, means controlled by the level of the water in said tank for opening and closing said valve, and a hygrostatic element for holding said valve closed when the air heated by said system is sufficiently humid irrespective of the level of the water in said tank.

5. A unit for a humidifier comprising a pipe connection provided with a valve seat, a support for said pipe connection, a valve co-acting with said seat, a float pivotally mounted in said support and connected with said valve, and a hygrostatic element mounted on said support, and having a lost motion connection with said valve.

6. A unit for a humidifier comprising a pipe connection provided with a valve seat, a support for said pipe connection, a valve co-acting with said seat, a float pivotally mounted in said support and connected with said valve, and a hygrostatic element mounted on said support and connected to said valve.

7. A combined radiator and humidifier comprising a plurality of vertically arranged radiator sections, each section including a pair of spaced heating conduits, a pair of vertical flanges, and a base flange forming a part of each of said sections, arranged to co-operate with similar flanges of the adjacent section to form a single humidifier chamber wholly within the radiator, each of said vertical flanges extending from one end of said heating conduits and lying in a plane intermediate, the inner and outer faces of the conduit to form a holder for a sheet of absorbent material.

No. 185,555

The Liberty Aeroil Burner, Inc., assignee of Valerian J. O'Farrel, both of New York City, assignee of Herbert E. Rider, Brooklyn, New York, both in the U.S.A., 16th July, 1918; 6 years. Filed 3rd October, 1917. Receipt No. 285,927.

Claim.—1. In an oil burner of the class described, a retort comprising a shell, and a plurality of corrugated rods of metals having different co-efficients of expansion mounted in contact with each other within the shell.

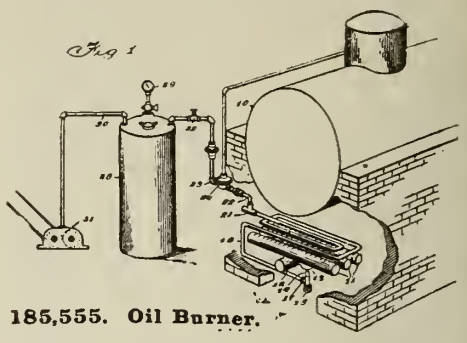
2. In an oil burner of the class described, a retort comprising a shell and a plurality of rods of metals having different co-efficients of expansion mounted within the shell, all in contact with each other and secured at one end, the movements of the rods relative to each other and to the tube with changes of temperature preventing accumulation of carbon on the rods and in the tube.

3. In an oil burner of the class described, a retort comprising a tube and a plurality of rods of metals having different co-efficients of expansion arranged within the tube in contact with each other and secured at one end, said rods being corrugated so that their relative movements with changes of temperature, reduce the accumulation of carbon on the rods and in the tube.

4. In an oil burner of the class described, a burner and a coil mounted over said burner, and comprising a tube and a plurality of corrugated rods of metal having different co-efficients of expansion mounted within the tube in contact with each other and secured at one end, said rods forming interstices between them for the passage of foil and serving to conduct heat through the tube.

5. In an oil burner of the class described, a burner head comprising a plurality of detachable burners, a distributing duct supporting the burners and disposed centrally under the burners, an inlet for a mixture of air and gas formed in the distribution duct, a nozzle under the inlet, and a retort connected to the nozzle and comprising a shell having a plurality of rods of metals having different temperature co-efficients mounted therein in contact with each other.

6. In an oil burner of the class described, a burner head, and a retort disposed over the burner head and terminating in a nozzle for supplying a gaseous



185,555. Oil Burner.

mixture to the head, said retort comprising a thin tube having a plurality of small rods therein in contact with each other to conduct heat throughout the tube, said rods being of metals having different temperature co-efficients to utilize the different expansions thereof with changes of temperature to prevent accumulation of carbon within the tube.

ADMISSION OF AIR TO FURNACE FIRES

The wasteful burning of coal takes, in large measure, the form of incomplete combustion. To burn 1 pound of the average coal requires about 14 pounds of air. The air is just as necessary for the combustion as is the coal. When the fuel bed is kept level and 4 to 6 inches thick, only about 7 pounds of air can be supplied through the fuel bed for each pound of coal burned; increasing the rate of air supply merely makes the coal burn faster. The other 7 pounds has to be supplied immediately over the fire. The air supplied through the fuel gasifies the coal, and the gas must then be burned in the combustion space. This is true, no matter how much air we try to force through the fuel bed; if we force through 7 pounds of air we gasify 1 pound of coal; if we force through 70 pounds, we gasify 10 pounds of coal, and if we force through 700 pounds, 100 pounds of coal is gasified, and so on. In other words, the amount of air supplied through the fuel bed determines only the rate of combustion. The completeness of the combustion is determined by the amount of air that is added and mixed with the combustible gases over the fuel bed. The gases mixed with the air burn in the combustion space, and the flames are the visible evidence of this burning of the gases. If there were no gases burning over the fuel bed, there would be no flame.—(U. S. Bureau of Mines).

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THE APPRENTICESHIP PROBLEM

IN spite of the fact that no small amount of interest has been taken in the apprenticeship problem, the fact remains that more work must be done and more attention paid if the sanitary, heating and ventilating profession is to maintain the tone standard it deserves.

A representative of SANITARY ENGINEER interviewed quite a number of employers as well as journeymen recently, with a view of procuring some first-hand information as to the opinions of both sides. And some very interesting, as well as lamentable, facts were disclosed.

In one large city the following views and opinions were expressed: "We simply will not employ a union man in our shop," said one. When asked why, it was stated that they had tried out union men and while peace reigned before such men were employed, trouble came soon after, and a score and one reasons, which must be frankly admitted were unreasonable. Another employer stated that they employed none but union men, got good service from them and all were first-rate mechanics. But the apprenticeship question was a big obstacle. This employer gave some startling facts. Said he, "What are we going to do for men very soon? We are not training any Canadians to work at the trade. We procure all our full-fledged mechanics, or nearly all, from England or Scotland, and many of our men right now are leaving us to go back home. What we want more than all is a real understanding with the trade union men. We must and should work with them, and we should meet them with a fair agreement that these apprentices would not be used to the detriment of the journeymen. There is a suspicion in the minds of both the employers and employees which almost amounts to fear, and until these conditions are remedied I do not think that the apprenticeship problem, and mind you, it is a problem, will ever be solved."

A number of other employers, too, were interviewed, and all more or less expressed similar views. One employer stated that he would run his business just as he liked and would employ whom he chose, union or non-union men. But such a stand is not by any means commendable, because in these days we must forget such sentiments. In fact, co-operation is the present key to progress, and unless capital and labor, if you so wish to term employer and employee, does not co-operate both will suffer.

Interviewing a number of journeymen, both union and non-union men, the following opinions were expressed: "The trouble is that instead of employers getting right down to brass tacks and keeping men in work steady they allow our trade to work in fits and starts. They rush into harness in spring, take jobs at unheard of low prices, and when the building season ends we get laid off. Such conditions mean that we have to demand high wages to keep the wolf from the door in winter. And somehow we must regulate the number of apprentices in each shop so as to ensure more work for the 'grown-ups.' If every boss in our trade would plan ahead, take more interest in creating work, they would benefit just as much as we would and more, because their capital would turn over oftener."

Another journeyman when asked about the apprenticeship question, asked another question before he would answer ours. "What appears to be the trouble with our employers? They are only reaping what they have sown. I don't refer only to plumbers, but to the whole building trade. Why did capital close up so —— tight when war was declared? We were fired; no work for months and months. Buildings that were under construction were stopped, and we are experiencing a shortage of houses chiefly because of the stand which capital and employers in general took when war was declared. And now when building operations are likely to become more active, the employers begin to yell for more apprentices. What plans are there being made to absorb these young fellows when the present shortage has been supplied? We are only human. We are only acting in self-defence, and if we do not get together soon the problem will be taken out of our hands to solve. This man frankly admitted that there should be more apprentices employed, but was not prepared to say what per cent per shop should be permitted.

Another journeyman was not in favor of technical schools under present management. He was of the opinion that in every technical school there should be a voluntary committee appointed or formed, representing the school, the employers and em-

ployees. And that figures should be procured showing just how many apprentices could be absorbed and proved same accordingly. He also suggested that every plumbing class formed should comprise boys who were employed during the day at the trade and that such apprentices should be given a number of half-days per week to attend school instead of depending solely upon night study and attendance.

Now, it will be seen by the opinions expressed of those men interviewed that there is a feeling in the minds of both employee and employer that something should be done and done quickly. Would it not be a good thing if both interested parties would try and get together on this subject, thrash it out and have this problem settled on a fair and satisfactory basis, this year of our Lord, nineteen hundred and nineteen?

LET YOUR LIGHT SO SHINE

THE greatest business topic that is being discussed these days is that which has a bearing upon the unsettled state of the world as a result of the sudden cessation of war, and the manufacturing of goods required to carry on the war. Some call it "a period of reconstruction," others refer to the problem as being one of reorganization. In some countries both terms would be correct, because there has been a great deal of loss in buildings, land has been torn up, towns levelled. In such countries both a period of reorganization and reconstruction must exist.

But in Canada and on this continent our problems are somewhat different. Canada has increased in population and no buildings have been erected to take care of material growth. Our soldier boys are coming back with wives and families, all of whom must be housed. Industries have sprung up as it were "in a night," and these industries must be kept going. So that in Canada we would be more correct were we to refer to present conditions as requiring a reorganization of our forces; forces of capital and forces of labor.

There never was such a feeling of suspicion in the minds of capital and labor as there is to-day. This feeling is very much uncalled for, and instead of both parties insisting that they will "let their light shine," each are trying to dim the other's light, notwithstanding that each must admit that the other is vitally necessary to his welfare.

When a little boy at school the writer remembered well the fable of the two cats who jointly had stolen some cheese. They could not decide how to divide it; one wanted more than the other, etc. So it was finally decided to take the cheese to Mr. Monkey, the judge. He, of course, like most judges, looked very, very wise, understood the case perfectly well and forthwith broke the cheese in two, placed the pieces on the scales and found that one piece was heavier than the other. He at once bit a large piece out of the heavier, making it the lighter piece, and repeated the operation, biting from one piece and then the other until all the cheese was gone.

That's just about like what capital and labor are doing right now on this continent.

Both sides should get together and treat each other as a body of intelligent men; neither should try to deceive the other. Those days are gone. The cat with the biggest piece of cheese will simply have to agree with the other cat to have both pieces accurately weighed and divided in a proper scientific manner, adopting such methods as will be up-to-the-minute, not such as were adopted under the old antiquated law of supply and demand. Then let's all get together and supply the demand—only supplying what is demanded — because, after all, every person is the law of supply and demand in himself.

Let us all do our utmost to create both supply and demand, let us all make our light so shine, etc., and not spend too much time in dimming the issue as appears to be the case to-day. Everybody knows there is a shortage of houses. Let's get together and work out ways and means to provide those homes

Every sanitary and heating engineer knows that the farmer will be a better, healthier and more efficient citizen if his home is fitted up with sanitary plumbing. Very well, let's get down to advertising and telling the farmer what we can do for him. Go out and paint pictures to him, show him right on the spot what you can do for him. "Let your light so shine."

A Real Lesson in Thrift

A COLORED gentleman went into a down-town store to buy a suit of clothes. He wanted to pay about $20. In fact he had that much set aside for the purpose.

The clerk, well schooled in the art of making people buy what they couldn't afford to pay for, had the customer prancing around in a $35 outfit, and was telling him that that was the sort of togs he should wear.

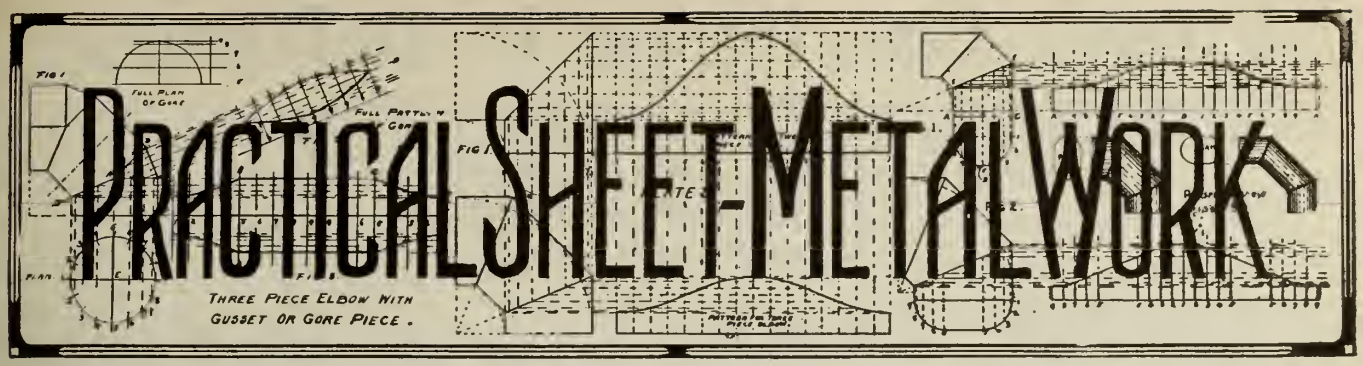
The colored man simply smiled, stuck out for a $20 outfit, and remarked "I never hang my hat no higher than I can reach."

And there's quite a heap of common sense and wisdom in the saying.

Is there anything more painful than witnessing a man with a $2,000 income trying to make a splash that looks like that of his neighbor who reaches through the cashier's wicket for $5,000 per annum?

And yet it's being done all the time. Two dollars can't go as far as five, and two thousand can't do what five thousand can. That looks simple enough, but the people who fail to realize that fact would make quite a heap were they all pitchforked up together.

That colored man preached a pretty fair sermon on "thrift" when he announced his text as "I never hang my hat no higher than I can reach."



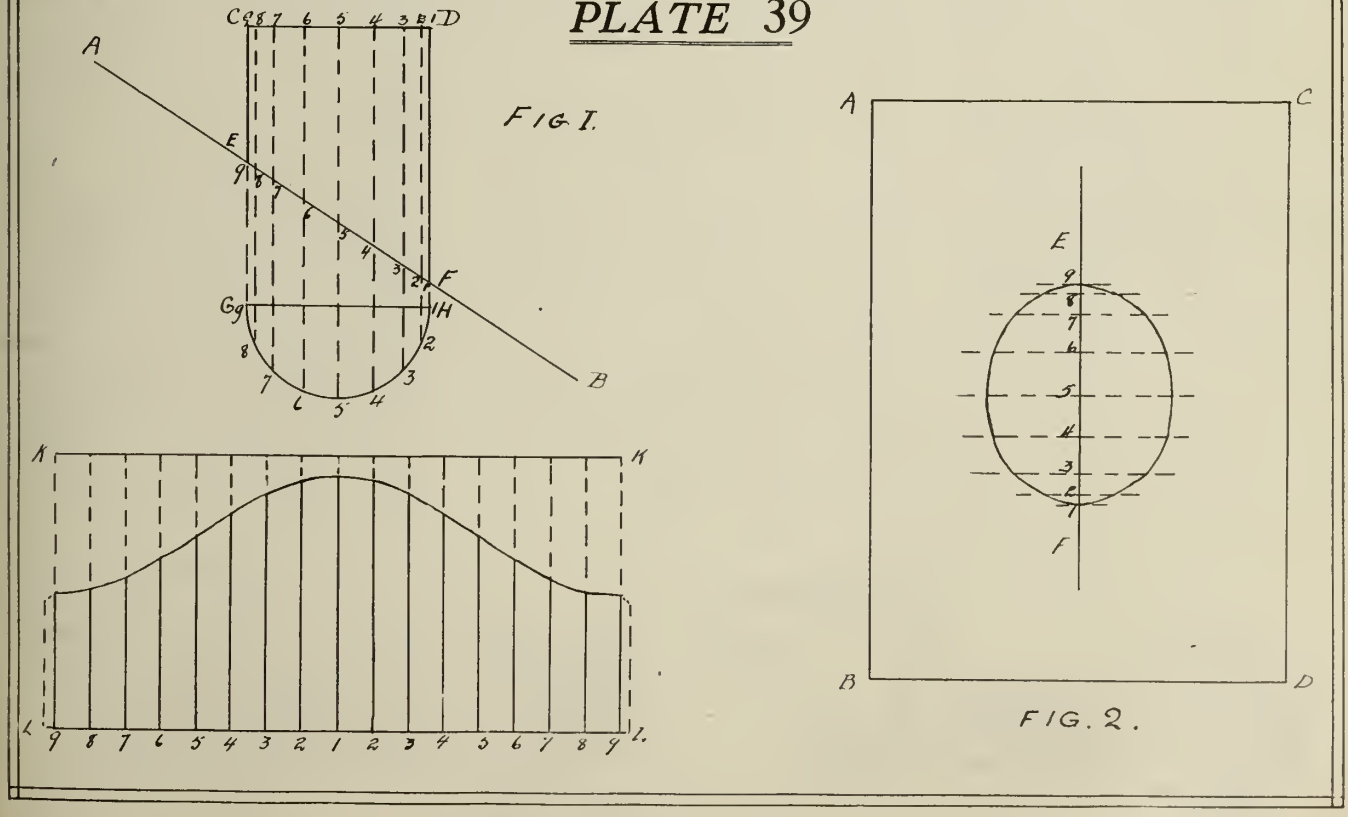
BY THOMAS STANSFIELD

IN this is shown a round pipe resting on a roof of one pitch or slope, with flange for pipe at roof line. In Fig. 1, or the side view, let A-B represent the slope of the roof, and C-D-E-F the elevation of pipe joining same. To develop pattern for pipe with cut to fit the roof proceed as if cutting a section of an elbow, on C-D or on a line parallel to it as G-H, draw a half section of the pipe as shown by semicircle, and divide into a number of equal parts as shown by 1, 2, 3, 4, etc., from these points draw lines parallel with D-F, extending them until they join the lines C-D and E-F, our next step is to draw two parallel stretchout lines as K-K and L-L, now erect lines at right angles to L-L joining to K-K as shown line on either end at K-L. From this point set off with the compasses or dividers the spaces 1, 2, 3, 4, etc., on section on line G-H, repeating to make the circumference complete. With compasses measure distance from line C-D, to the point on line E-F which is intersected by the lines drawn from points in section on line G-H, commencing at C, measure the distance C to E, and set off from line L-L on line K-L. Measure the next line 8, to its intersection at E-F, and set off from L-L on second line, which can be numbered 8 to correspond to line on C-D. Measure the next line 7 to its intersection with E-F and set off from L-L on line 7. Proceed in same manner with remaining lines 6, 5, 4, 3, 2, 1, which will form one-half the pattern, to complete full diameter repeat as shown on lines 2, 3, 4, 5, 6, 7 in the same manner. A line drawn through the points obtained will give outline of pattern required.

To obtain pattern of flange with opening for pipe, draw the outline of flange as shown in Fig. 2, by A-B-C-D, draw a line through the centre of flange, parallel with A-B, as E-F, on this line set off the spaces between E and F, found by the lines drawn from section G-H in Fig. 1. With compasses measure from line G-H to the points of circumference as marked by divisions 1, 2, 3, etc., and set off on both sides of line E-F, on flange, Fig. 2. Setting distances obtained on lines numbered to correspond, as shown at point 1 on line 1, 2 on line 2, 3 on line 3, etc. A line drawn through points obtained will give outline of opening in flange to receive pipe.

(To be continued.)

PLATE 39



Proper Gas Piping in Buildings

Larger-sized Pipe Saves Gas—Greater Pressure of Gas Passing Through Bunsen Burner Creates a Higher Vacuum of Air—Flame is Hotter, Thus Requiring Less Time to Cook or Boil Food on Gas Stove—Same Applies to All Gas-burning Appliances

By GEO. W. ALLEN, Toronto

I WAS very much innterested in your article entitled "Pipe Sizes for Gas Installations," and having had a good many years' experience in gas appliances, gas manufacturing and installations of almost every type, I thought a little explanation as to why ample sizes of pipe should be used, would be of interest. I have heard plumbers, contractors and architects express great surprise when they have been asked to install larger sizes of pipe.

The argument often put up has been that the small holes, or outlets at the burner of each gas fixture, did not by any means represent the total area of the bore of main gas pipes installed.

If architects, plumbers, and gas fitters fully realized the importance of proper gas piping installations there would be less cause for complaint among gas consumers about high gas bills. It is a common belief among these men and others that gas companies desire large gas pipes so that the consumer will use more gas. That this calculation is a gross error cannot be disputed. The writer's own experience with the solving of gas account complaints have, in many cases, been traced to faulty piping. I will not go into long technical explanations relative to the reason why large gas pipes save money to the consumer, but will endeavor to explain the reason in as non-technical language as possible, in order to convey the main idea to the reader. All installations for gas appliances require maximum pressure in order to give maximum service. The large pressure of gas does not necessarily mean a large flow of gas through the burners. But it does mean that if a "pin-head flow" of gas is allowed to enter a Bunsen tube at high pressure, a corresponding high vacuum is set up with the air in the burner, thereby causing a large inrush of outside air to enter the air mixers and to mix with the gas. The result of this is a uniform mixture, and if ignited will give a maximum amount of heat at the burner. It therefore stands to reason that if the pressure is checked by reason of small pipes the gas valves will have to be opened wide at the burner in order to get a sufficient supply. Being a larger volume of gas it therefore has not the same air-pull as the high pressure, and the result will be a reduced heat, thereby delaying work and a consequent high gas bill. The accompanying illustrations give a fair idea of the above reasoning.

We will first turn to Fig. 0. Note that the gas orifice is reduced, which is equal to having the gas cock partly closed.

"A" shows spud or needle point valve with gas entering burners with force. Having plenty of pressure behind it, it has no need of the valve being turned on unnecessarily full. This stream of gas gradually widens until it fills the diameter of the burner tube, and forces the air ahead, consequently drawing in more air to the burner through the air openings marked "B."

Now turn to Fig. 2, which gives a fair idea of a gas supply cut down when small piping is installed.

"B" shows very little air entering the tubes, consequently an imperfect mixture is made, resulting in imperfect combustion and low heating value. Conditions vary in many cases. The ideal way to help remedy gas troubles is to see that proper piping is installed in the first place. The friction in gas pipes grows greater as the pipe sizes are reduced, and, although one can possibly get all the gas required through it, yet the heating value will be reduced, and if it entails a longer period in which to do the work it necessarily follows that more gas will be used. The writer for some months used a gas range connected to ⅜ piping thirty-five feet long. The result was ample gas for the needs of the home, but no pressure. Consequently it took six minutes to boil water, where with the new piping of proper size, three minutes now does—a saving of fifty per cent. on gas bills.

Incandescent gas lighting is vastly improved by the addition of a trifle more pressure delivered at the burner. The difference in cost is so small between the different pipe sizes that it is hardly worth bothering about.

If every house in Toronto, or, in fact, in every town or city where gas is used, were to have the piping examined, all sags in pipe taken out ,and such rules followed out as were advised in the article which appeared in your Feb. 1st issue, the users of gas would at once find that a great saving of gas, as well as time, would result. Though you published a splendid table of pipe sizes, I am submitting a table herewith that would be very much more easily remembered by the average pipe fitter. I have no fault to find with the table whatever; it is, I believe, the most complete one I recall having read for some time:

Size of piping	Greatest length allowed	Greatest number of ⅜-in. openings
⅜ inch	20 feet	1 opening
½ inch	30 feet	2 openings
¾ inch	60 feet	10 openings
1 inch	70 feet	15 openings
1¼ inch	100 feet	25 openings
1½ inch	150 feet	50 openings
2 inch	200 feet	100 openings
2½ inch	250 feet	200 openings
3 inch	300 feet	350 openings

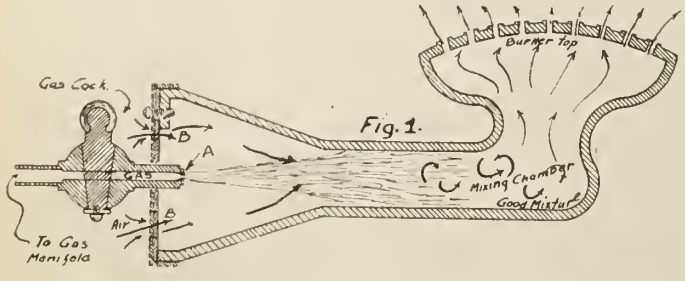
Rising main in no case to be less than ¾-inch.

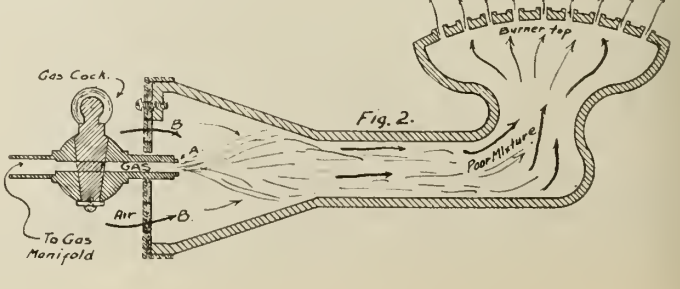
Pipe supplying stove in no case to be less than ¾-inch.

Pipe supplying gas grates must be ½-inch.

Outlets not to extend more than two inches beyond plaster.

One common cause of trouble is in allowing gas-fitters to place pipes of a size only sufficient for present requirements without any regard for future use whatever. Gas is fast coming to the fore as an illuminant, and for fuel purposes in the home as well as in large industrial plants, and ample allowance should be made for any additional appliances that may later be installed. Often it is required to make an upstairs sitting room in a home and if a mantel grate is required the usual practice is to connect it with the nearest gas main. The result is—trouble. After the pipe riser is installed (which, by the way, should be of a size to carry at least twenty-five per cent. of an overload), the main pipe line should be extended from front to rear of the building, all of one size, and off this to install individual branches to their respective outlets.





Annual Report of Winnipeg Plumbing and Drainage Department

Some Splendid Food For Thought—Many Items of Interest to Every Sanitary Engineer in Canada—The Report Proves the Importance and Necessity of a Plumbing Department For Every Town, Village or City

IN reading over this report one cannot fail to note how important such a department must be to the welfare of the citizens of Winnipeg.

We are all more or less liable to take so many things as a matter of course that we forget all the work, plans, ideas, and engineering skill that lay as it were behind the scenes of our daily life. Take for example one or two items mentioned in this report, the case where over 1,042 permits were granted to construct or reconstruct plumbing, out of which total 953 were for plumbing to be replaced. What would happen to the people of Winnipeg if such work was allowed to be done in any old slipshod way?

Another example, that of the inspecting of work being carried on in the usual way. Out of 5,337 tests and inspections made, 2,011 defects were discovered. Just imagine what that means. It means in most cases careless workmanship, poor material, unpractical constructions, and so on. Such conditions prove in themselves that defective work is being installed all over the Dominion. In fact if the members of the trade will look carefully over many of the catalogues issued they will see therein many fittings, many lines of goods that are totally unfit to be used in a practical plumbing installation. There must be an outlet for such goods or they would not be made.

In presenting this report to our readers we do so in the hope that it will be read because, as we stated in preceding paragraphs, there is an atmosphere of importance in almost every line of it.

PLUMBING INSPECTION DIVISION

Plumbing Permits and Inspections

During the year 1,042 permits were issued for constructing, reconstructing, adding to, or altering the plumbing and drainage systems in buildings throughout the city. The outstanding feature of the work done in this connection was that, of the 1,042 permits issued, 953 were for old buildings, where the plumbing was altered or added to, or required reconstructing. This condition will increase as time passes, and as the plumbing installed from 15 to 25 years ago becomes worn out, or obsolete, and therefore an increasing amount of time will require to be devoted to the reinspection of old work. A notable instance of this occurred this year in one of the largest hotels in the city, where the piping which had been installed about fourteen years ago was found to be so defective that it had to be entirely renewed at a cost of well over $50,000.

In the same period 5,337 tests and inspections were made, and 2,011 defects were discovered and rectified according to the following details:

TABLE I

TOTAL INSPECTIONS AND TESTS DURING 1918

Water Tests	Smoke Tests	Subsequent Inspections	Miscellaneous Inspections	Defects and Rectified	Total Inspect.
543	1,053	3,530	211	2,011	5,337

Certificates

The Winnipeg building by-law of 1913 provides that an occupancy permit for a building cannot be issued until the plumbing has been tested, inspected and certified. In conforming with this provision 23 certificates were issued to the building inspector. In addition, 106 certificates were issued to plumbing contractors for work done by them.

TABLE II

TOTAL PERMITS IN SEWER INSPECTION DIVISION FOR 1918

Permits Issued	Sewer Connections Constructed	Inspections
151	141	626

Sewer Inspection Division

Sewer connections are constructed under the supervision of this department, and sewer contractors working under a bond of $1,000 are permitted to make connections to the main sewers, except when the main sewer is not in the centre of the street. In such cases the city does the work and equalizes the cost, so that the owners of lots on each side of the street pay an equitable amount.

TABLE III

SEWER FLUSHING DEPARTMENT

Tank Flushing 256 Gallons Per Tank	Hose Flushing 125 Gallons Per Minute	Total
11,439,872	7,244,375	18,684,247

Fees

Permit and license fees amounting to $794.50 were collected.

Licenses

One hundred and twenty-four licenses were issued to master plumbers, 117 of these being renewals, for which a fee of $1 is charged, and 7 were for new licenses, the fee for these being $10 each.

Plumbing Installed by the City

In only one house was plumbing installed by the city, and the costs charged against the property as taxes. Undernoted is the location and cost of installation:

List No.	Location	Cost
51	783 Lorette Street	$249.50

CONTRAVENTION

Five prosecutions were instituted for contravention of the Plumbing By-Law, particulars of which are given below:

No. 1—Doing work without a license....	Fined $5.00 and costs, $7.35.
No. 2—Doing work without a license....	Convicted and reprimanded
No. 3—Doing work without a permit....	Fined $10.00 and costs, $12.35
No. 4—Doing work without a permit....	Fined costs, $2.35
No. 5—Doing work without a permit....	Fined costs, $2.35

Respectfully submitted,
(Signed) JAMES SMITH,
Plumbing and Sewer Inspector.

When a connection is to be made in a street paved with asphalt the owner is required to deposit with the city an amount sufficient to cover the cost of cutting and replacing asphalt.

Following is a monthly statement of permits issued, connections constructed, and inspections made during the year.

Licenses

Five licenses were issued to sewer contractors.

Fees

Permit and license fees to the amount of $83 were collected.

Sewer Maintenance Division

This division of the department attends to the repairing, flushing, and cleaning of the entire sewerage system of the city, comprising over 250 miles of main sewers.

Flushing

To flush the sewers, 684 underground tanks, with an average capacity of 256 gallons each are maintained and flushed regularly, and in addition there are one or two gangs constantly flushing with hose those sewers not flushed by tanks. The amount of water used for this purpose last year was 18,684,247 gallons, details of which are shown in the following statement:

Repairs

As in the past four or five years it has been noticed with growing concern that the necessity for repairing the concrete sewers is increasing rapidly, due to disintegration of the concrete, and this condition is not confined to any particular part of the city, nor is the disintegration confined to poured concrete as distinguished from pre-molded concrete, the latter being affected to almost as great an extent as the former.

Disintegration of concrete in sewers was first noticed on the Hart Avenue sewer about nine years ago, but was then considered to be due either to poor material or bad workmanship. This theory has been discarded, and it has now been definitely established that the trouble is due to alkali salts in the soil in combination with ground water. Most of the concrete sewers in the city are affected to a greater or lesser degree, and while it is comparatively easy to inspect and repair the larger sized sewers from 4 feet diameter upwards, as workmen can walk inside them, it is going to be a difficult matter examining and repairing sewers from 3 feet diameter to 2 feet diameter, as it is impossible for workmen to work inside them. At the present time there are several small-sized concrete sewers in precarious condition, which will require to be entirely reconstructed at an early date.

It is my intention to have a thorough survey made of the concrete sewers throughout the city early this coming spring, to ascertain their exact condition, when a detailed report will be made.

In addition to general repairs made to the sewers, catch basins, manholes and flush tanks, the following special work was done, particulars of which appear in Table 4.

During the period between January 2, 1918, to March 12, thirty-seven connections were frozen in different parts of the city, due to indrafts of cold air at manholes and catch basins, and thence passing up untrapped connections. This condition occurs only where house trap on the drain has been eliminated.

TABLE IV

MAIN SEWERS AND MANHOLES REPAIRED

Date	Location	Work Done	Remarks
May 17th	Pacific Ave. W. of McPhillips	Excavated and inserted 15 feet of steel casing	3′ 0″ sewer. Concrete disintegrated
May 29th	Flora Ave. 1st M.H. E. of McGregor	Rebuilt manhole	Concrete specials and rings disintegrated
June 11th	Wardlow Ave. W. of 1st M.H. W. of Clarke St.	New manhole built	
June 14th	Portage Ave. 1st M.H. W. of Burnell Street	Sewer excavated and repaired	3′ 0″ sewer. Concrete disintegrated
June 18th	McKenzie Street N. of College Ave.	Catch basin connection to main sewer dug out and repaired	Broken pipe
June 19th	Burnell Street N. of No. 567	Catch basin connection to main sewer dug out and repaired	Broken pipe
July 13th	Elgin Ave. N. of Tecumseh St.	Manhole rebuilt	Concrete specials and lower rings disintegrated
July 16th	Pacific Ave. Opposite No. 1561	Manhole rebuilt	Concrete specials and rings disintegrated
July 16th	Pacific Ave. N. of McPhillips St.	Excavated and inserted 15 feet of steel casing	3′ 0″ sewer. Concrete disintegrated
Oct. 1st	Broadway Ave. E. of Canora St.	Excavated and repaired sewer	18″ pipe sewer joint open
Oct. 7th	Cumberland Ave. W. of Carlton	Excavated to remove blockage in main sewer	
Oct. 22nd	Carruthers Ave., at Power St.	Manhole rebuilt	Concrete specials and lower rings disintegrated
Dec. 13th	Logan Ave., at Blake St.	Manhole rebuilt	Concrete specials disintegrated
Dec. 17th	Logan Ave. W. of Blake St.	Excavated and repaired sewer	2′ 0″ sewer. Concrete disintegrated
Dec. 27th	Newman Street S. of Portage Ave.	Manhole rebuilt	Concrete specials and rings disintegrated

TABLE V

FLUSH TANK REPAIRS

Date	Location	Work Done	Remarks
Apr. 13th	Owena Street, at Henry Ave.	Lead supply pipe repaired	
Apr. 16th	Dufferin Ave., at McGregor St.	Lead supply pipe repaired	
Apr. 18th	Craig Street S. of Portage Ave.	Lead supply pipe renewed	Old pipe destroyed by electrolysis
Apr. 23rd	Frances Street	Lead supply pipe repaired	
May 1st	Robinson Street N. of Stella Ave.	Lead supply pipe repaired	
May 3rd	Lydia Street No. of Notre Dame Ave.	Lead supply pipe repaired	
Oct. 15th	Furby Street S. of Notre Dame Ave.	Lead supply pipe repaired	

TABLE VI

SEWERS FROZEN

Main sewers at the following locations were frozen, due to indrafts at manholes and catch basins:

Date	Location
Jan. 6th	Hetherington Street and Nassau Street.
Jan. 10th	Rathgar Street at first catch basin west of Daly Street
Jan. 14th	Charles Street at first catch basin south of Inkster Avenue.
Jan. 18th	Mountain Avenue, at first manhole west of C.P.R. tracks.
Jan. 18th	Mountain Avenue, and first manhole west of C.P.R. tracks.
Jan. 25th	Sutherland Avenue and Stephen Street
Jan. 25th	Salter Street and Manitoba Avenue.
Jan. 26th	Salter Street and Boyd Street.
Jan. 26th	Salter Street and Mountain Street.
Jan. 29th	Arlington Street, opposite No. 1663.
Feb. 2nd	Clair Avenue at first catch basin west of Hay Street.
Feb. 5th	Beresford Avenue at first catch basin east of C.N. track.
Feb. 8th	Fleet Street and Nassau Street.
Feb. 22nd	Newton Avenue at first catch basin west of Roland Street.
Mar. 12th	Roy Avenue, opposite No. 1556.
Mar. 13th	Corydon Avenue and Wilton Street.

"Standard Sanitary" Reorganizes

Now Under the Direction and Management of An All Canadian Staff — Mr. Jas. A. Riordan Now President and General Managing Director—Outlook For the Concern Very Bright

A reorganization of the management and board of directors of the Standard Sanitary Co., Ltd., of Canada, will be of interest to the readers of the SANITARY ENGINEER.

Mr. James A. Riordan, who for the past ten years has been vice-president and general manager of the company, has succeeded Mr. Theodore Ahrens as president of the company and remains as general manager.

Mr. Riordan was born in Tipperary, Ireland, April 17, 1864, son of John and Mary (Carey) Riordan. Educated at public schools of West Bloomfield, N.Y. Began his business career as a clerk in the store of the Chicago branch of Sidney Sheppard & Company, tin plate and metal ware manufacturers, 1882-1883; travelled for that company out of Chicago, 1884-1886; began business as a manufacturers' agent in his own name in St. Louis, handling hardware and metal specialties, 1887-1896; sales manager for Dawes & Myler, sanitary ware manufacturers, New Brighton, Pa., 1896-1900; upon the formation of the present company (of which Dawes & Myler was a subsidiary company) Mr. Riordan was made manager at St. Louis and Western representative of the Standard Sanitary Manufacturing Company, 1900; came to Canada and opened up the Canadian business, 1910, of which he became vice-president and general manager. Member of the Canadian Manufacturers' Association and was chairman, Transportation Committee, 1916-1917, and is still a member of the Toronto Board of Trade.

Mr. Riordan is well known personally to the trade from the Atlantic to the Pacific, and this announcement will be received with pleasure by his many friends.

JNO. A. RIORDAN
Elected President and General Manager

Mr. Hugh S. Wallace, who succeeds Mr. Riordan in the office of vice-president, has also been elected one of the directors of the company. Mr. Wallace's connection with the company began in 1910, when he disposed of his business to this company, remaining as manager of the Hamilton branch until 1915, when he assumed the managership of the Toronto jobbing house. Mr. Wallace is one of the trade's old stand-bys, having now been directly connected with the industry upwards of thirty-five years, and is one of the best known men in and around Ontario. His many friends in the trade throughout Ontario will congratulate him on his preferment.

Mr. C. F. Rogers, manager of the company's Hamilton jobbing house, has been elected one of the directors. Mr. Rogers' connection with the company also dates from the year 1910, at which time he entered the company's service as traveller for the Hamilton branch, succeeding to the managership in 1915, when Mr. Wallace moved to Toronto.

Mr. Rogers is on old London boy and is a nephew of Mr. T. A. Stevens, of the Empire Manufacturing Company, London. Throughout Southern Ontario, from Niagara Falls to Windsor, twenty years constantly meeting with members of the trade has built for Mr. Rogers many good friends. In fact everybody knows "Charlie" and will wish him all kinds of success.

HUGH S. WALLACE
Elected Vice-President and Sales Manager, Toronto

STEAM BOILER REGULATION AND CONTROL

A vital factor in the economical operation of steam boiler installations is the proper regulation of the damper to suit the furnace and load conditions. Firemen are usually neglectful of damper control, often because of its inconvenient position and the clumsy provision made for handling it. The damper can be used to advantage when the boilers are banked, to keep cold air from passing through the setting, to maintain a nucleus of incandescent fuel to aid in starting up the boilers, and to reduce the amount of coal required to raise the steam pressure.

In order to secure proper manipulation of the damper, a simple and easily operated means of control should be provided, so situated that a draught gauge is in plain view to guide the fireman in the operation of the damper.

The installation and use of the underfeed stoker does not minimize the importance of proper damper regulation.

In boilers fired by natural gas, automatic control of the damper gives very good results. The control can be connected to the burners so that the boiler damper is closed tight and the gas shut off from the burners when the steam pressure gets above the normal. Thus the exactly correct mixture for the most effective combustion can be originally obtained, and when the damper regulator has been correctly set afterwards always maintained by the automatic control.

C. F. ROGERS
Director and Sales Manager Hamilton Branch

Market Conditions and Tendencies

Statements Regarding Supplies and Trend of Prices

THE MARKETS AT A GLANCE

PRICES on plate have undergone a further revision downward in some quarters this week, and the heavy gauges of black sheets have also narrowed towards the lowest basis. Supplies are now very good in these lines, and the same is true of galvanized sheets, on which business is being keenly developed.

Ingot metals have again come in for some revision, perhaps the greatest change being that in copper, which is down in sympathy with declines recorded in the United States markets. The abundance of scrap is retarding the sale of this metal. Tin is quite active, stocks light, and a lower basis has been reached. Lead is weak, and spelter has declined another ½c per pound.

Solder has registered another slight decline, amounting to about 1c per pound. Manufactured lead products are held without change, and the same is true of range boilers and enamelware, no features of particular interest attaching to these at the present moment.

Boiler tube orders for later delivery are being accepted by some jobbers, the prices named on these being about 10 per cent. below quotations for spot stocks. There has been a very fair movement of tubes to the trade, and supplies are within rather narrow compass.

Cotton waste has undergone a revision to lower levels, prices being down from 1c to 2c per pound, according to grade.

TORONTO, February 13.—Lower prices on steel plate have been named and heavy black sheets are also lower in some quarters. Cotton waste has declined from 1c to 2c per pound according to grade. Solder is slightly easier and some metals have sagged, copper, tin and spelter being among the lines to reach lower levels. Some uncertainty exists as to future trend on some lines but trade seems to be getting down to a very fair basis with production costs on many classes of goods.

Range Boilers Record No Change

RANGE BOILERS.—No new developments are yet to be noted in respect to range boilers. There is little business offering at the present time, and this is being met from ample stocks. Prices to-day follow:

	Standard	Extra Heavy
30-gallon range boilers	$14.00	$17.00
35-gallon	17.00	20.50
40-gallon	20.50	24.00
52-gallon	28.00	32.00
66-gallon	37.00	42.00
82-gallon	45.00	50.00
100-gallon	62.00	70.00

Enamelware Holding at Steady Basis

ENAMELWARE.—The basis is a steady one and no particular feature of interest is yet noted in the markets on enamelware. Business is within rather a narrow compass but this is not unusual at this time of the year. Prices on some of the standard lines are given herewith:

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Basins, flat back, 14 x 15 in.	6 00
Do., corner, 15 in.	5 95
Sinks, roll rim, 18 x 30 in.	15 05
Closets, oak tank and seat	27 00
Do., enamel iron or white vitro tank	29 00

Unions Easier; Soil Pipe Unchanged

SOIL PIPE, FITTINGS.—A decline in the price of Dart unions has been made this week, ¼ to 2 inch now being quoted at a discount of 20 per cent., and 2½ inch and larger, 12 per cent. from list; these supersede discounts of 15 per cent. and 6½ per cent. respectively. Other pipe fittings are unchanged. Soil pipe and fittings record no change this week. Buying is within a narrow compass and conditions at the moment just a little uncertain. Range of quotations follows:

SOIL PIPE AND FITTINGS

Medium and extra heavy soil pipe, 2 in. to 6 in.	15%
Medium and extra heavy fittings, 2 in. to 6 in.	25%
8 in. soil pipe and fittings	Net list

C. I. PIPE FITTINGS

Cast iron fittings	12½%
Plugs	22%
Bushings	28%
Unions, standard	35%
Dart unions, ¼-inch to 2-inch	20%
Do., 2½-inch and larger	12%
Nipples, up to 4-inch	45%
Do., 4½-inch and larger	40%
Do., running thread 4-in. and under	25%
Couplings, 4-in. and under	35%
Do., 4½ in. and larger	15%

MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittings, Class A, lb.	0 53	0 66
Do., Class B, lb. net	0 24	0 33
Do., Class C, lb. net	0 16	0 24

Unchanged Position Noted in Valves

VALVES.—There have been no changes recorded in valves and new conditions are also lacking. A fair amount of business is offering and being taken care of readily.

	Discount off list
Compression work, standard	45
High grade	41
Fuller work, standard	43
High grade	36
Basin cocks, No. 0 standard	38
Nos. 1 and 2	38
Bath cocks	48
Flatway stop and waste cock, standard	45
High Grade	45
Roundway stop and waste cocks, standard	45
High Grade	45
Brass steam cocks, standard, add 10%.	
Globe, angle and check valves, standard.	Net
Do., removable disc	Add 5%
Radiator valves, standard	10
Do., removable disc	Net List
Basin Cocks—	
No. 0 and 1, Fuller pattern	43
Globe, angle and check valves, standard, medium pressure	10
Radiator valves, standard med. pressure.	30
Radiator valves, removable seat, medium pressure	25

Cotton Waste Declines; Oakum Unchanged

COTTON WASTE.—In line with information given out in SANITARY ENGINEER last issue, prices on cotton waste have been revised downward in

some quarters, the declines ranging from 1c to 2c according to grade and type. On the new basis of quoting these figures rule on white waste: XXX Extra, 19½c per pound; XX (replacing X Grand), 18¼c; XLCR, 17c; X Empire, 15½c; X Press, 14c. Colored Waste: Fancy, 15½c per pound; Lion, 14c; Standard, 12½c; Popular, 11c; Keen, 9½c; Cream polishing, 21½c per pound. Oakum rules without any change and only a fair amount of business being offered.

	Per 100 lbs.
Best American	$21 00-$22 00
Clipper, spun	21 00
Do., unspun	10 50
Plumbers', spun	10 00- 10 50

Wrought Pipe Remains Unchanged

WROUGHT PIPE.—Wrought pipe is ruling at steady figures and some business is being done. Stocks generally are low, dealers exercising care in buying but deliveries are satisfactory. Prices appear in panel herewith:

WROUGHT PIPE
Price List No. 38—January 6, 1919.

	Standard Buttweld Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
⅛ in.	$6 00	$ 8 00	$	$ ....
¼ in.	4 68	6 81	5 28	7 41
⅜ in.	4 68	6 81	5 28	7 41
½ in.	6 21	7 78	7 06	8 63
¾ in.	7 82	9 95	8 97	11 10
1 in.	11 56	14 71	13 26	16 41
1¼ in.	15 64	19 90	17 94	22 20
1½ in.	18 70	23 76	21 45	26 54
2 in.	25 16	32 01	28 86	35 20
2½ in.	40 37	51 19	.....	.....
3 in.	52 79	66 94	.....	.....
3½ in.	67 16	84 18	.....	.....
4 in.	79 57	99 74	.....	.....

	Standard Lapweld Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
2 in.	$28 86	$35 34	$32 56	$39 03
2½ in.	42 12	52 36	47 97	58 21
3 in.	55 08	68 47	62 73	76 12
3½ in.	69 00	86 94	78 20	96 14
4 in.	81 75	103 00	92 65	113 90
4½ in.	93 00	118 00	112 00	137 00
5 in.	108 00	137 00	130 00	159 00
6 in.	140 00	178 00	169 00	206 00
7 in.	183 00	232 00	219 00	268 00
8L in.	193 00	244 00	230 00	281 00
8 in.	222 00	281 00	265 00	324 00
9 in.	266 00	336 00	.....	.....
10L in.	246 00	312 00	294 00	360 00
10 in.	317 00	402 00	379 00	464 00

Terms, 2% 30 days, approved credit.
Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Boiler Tubes Moving; Stocks Low

BOILER TUBES.—A fair amount of business is being done in boiler tubes and stocks are at a comparatively low ebb. The tube situation just now is one that comes under the two-price heading. This is not true in all cases, but in several it is. The warehouses have stocks in some cases that were taken in at war prices when help was scarce and costs very high. They have not enough of this to make them stampede the market and they are able to get new stock at the lower prices, but it takes time. Buyers of tubes if they watch their needs ahead can save a little money here. If they can so arrange matters that they can wait for a couple of weeks for delivery they can buy tubes at ten per cent. below the price if they want them taken out of the stock that warehouses have on hand. There seems to be a tendency on the part of the Canadian trade in nearly every case to give the buyer the advantage as soon as it it possible to do so.

BOILER TUBES—	Per 100 feet Seamless	Lapweld
1 inch	$32 00	$.....
1¼ inch	36 00	.....
1½ inch	39 00	32 00
1¾ inch	39 00	32 00
2 inch	45 00	32 00
2¼ inch	48 00	34 00
2½ inch	50 00	40 50
3 inch	58 00	45 00
3¼ inch	.....	52 00
3½ inch	70 00	54 00
4 inch	80 00	67 00

Some Revisions in Plates; Fair Orders

SHEETS, PLATES.—There have been some slight revisions in the prices of plate to lower levels. Other lines of sheets remain unchanged at figures given below and jobbers report a fair amount of business coming to hand, and quite an inquiry which is expected to develop into orders in due course. Stocks are very good and outlook considered satisfactory.

BLACK SHEETS—	Per 100 lbs.	
10 gauge	$6 50	$6 90
12 gauge	6 05-6 60	7 00
14 gauge	6 10	6 65
16 gauge	6 20	6 75
18-20 gauge	6 80	7 30
22-24 gauge	6 85	7 35
26 gauge	6 90	7 40
28 gauge	7 00	7 50
3-16 inch plate	6 25	6 75
¼-inch boiler plate	6 00	6 50

Prices shown are for full cases. An extra charge of from 25c per 100 lbs. is made for less than case lots.

GALVANIZED SHEETS—		
10¾ oz.	8 50	$9 00
U.S. 28	8 20	8 75
U.S. 26	7 90	8 45
22 and 24	7 75	8 30
18 and 20	7 60	8 30
16	7 45	8 00

Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

Some Slight — Change in Solder

LEAD AND ZINC PRODUCTS.—Some slight changes are reported in prices on guaranteed and strictly solder, quotations being down about 1c per pound. Wire solder is quoted up to 50c in some quarters. No change has been made in manufactured lead products, pipe and traps and bends holding at figures below:

Lead pipe, lb.	....	$0 13
Lead waste pipe, lb.	....	0 14
Lead traps and bends	....	Net list
Lead wool, lb.	..	0 14
Lead sheets, 4 to 6 lbs., sq. ft., in rolls, lb.	0 11	0 12½

Cut sheets ½ to ¾c lb. extra and cut sheets to size, 1c lb. extra.

Solder, guaranteed, lb.	$0 37	$0 39
Solder, strictly, lb.	0 33	0 37
Solder, commercial, lb.	0 31	0 36
Solder, wiping, lb.	0 30	0 32½
Solder, wire, lb.	0 45½	0 50
Zinc sheets, per lb.	....	0 20

Old Materials May Go Lower

OLD MATERIALS.—The scrap metal market remains dull. In fact, "stagnant" is a better word. There are no deals put through, and the chances are that the claims made by the dealers that they are losing money on present operations are quite correct. Dealers are not anxious to buy even at the present battered down list. They fear further drops in prices, and, as a matter of fact indicate that lower prices may be reached, and do not care to get caught in a declining market, especially when there is no urgency in the situation to force them to buy.

Dealers' Buying Prices—		
Tea lead	...	0 03½
Heavy lead pipe	0 04	0 04½
Pipe scrap	14 00	15 00
Stove plate, per ton	14 00	15 00
No. 2 busheling	8 00	9 00
Old rubbers, boots and shoes	0 07½	0 07¾
Overshoes, lumbermen's rubber boots	....	0 05½
Bicycle tires	0 02½	0 03½
Automobile tires	0 03½	0 04
Yellow brass	0 08	0 08½
Red brass	0 14	0 15
Light brass	....	0 06
Scrap zinc	0 05	0 05½
Heavy copper	0 16½	0 17½
Wrought iron, No. 1, per gr. ton	18 00	19 00
No. 1 machinery cast	24 00	26 00
Heavy melting steel	....	13 00

Copper Lower; Tin, Spelter Too

INGOT METALS.—Lower prices on copper and spelter have been recorded this week. There is a fair amount of activity noted in tin and stocks, though not heavy, are ample to meet the demand.

COPPER.—The substantial declines recorded in the United States market on copper have been reflected here and quotations to-day range around 21c to 22c per pound. There is only a fair amount of business being done in the metal here, the heavy stock of scrap being a factor to retard the sale of the metal.

TIN.—A somewhat lower basis has been determined upon in tin, quotations ranging from 60c to 65c per pound. There is a fair amount of activity and stock is considered ample to take care of the immediate demand.

SPELTER.—It is indicated that there is very little spelter on spot. However, there is not a great deal of interest being shown in this metal and prices have sagged half a cent a pound to 8½c.

LEAD.—Dullness marks the position of the metal this week. There are only small lots moving and stocks are quite ample to meet even very much heavier demands. Quotations are unchanged for the week at around 6¾ to 7c per pound.

ALUMINUM.—There is nothing new to report in this metal, commercial interests still very largeely keeping out of the market. Nominally quotations range around 50c per pound.

ANTIMONY.—There have been no particularly interesting features develop in regard to this metal this week. Sales are light and stocks are comparatively heavy. The price holds at 8½c per pound.

TAKEN OVER BUSINESS

For upward of five years Messrs. Kennedy & Desroche, of Penetang, Ont., have conducted a nice plumbing and heating business. Mr. J. E. Desroche has taken over the business now, and Mr. Kennedy expects to establish a hardware business in Western Ontario. He has not given out his full plans for the future as yet.

SOLD BUSINESS TO STAFF

W. McGee, plumber and tinsmith, Belleville, has sold out his business to two of his employees, Messrs. Diamond & Hyde; the former acted as sales clerk, the latter as bookkeeper. Mr. McGee has been in business for about 30 years, was a practical man, good mechanic and well liked by a large number of friends. The new owners, too, have earned the respect of quite a number of people, are attentive to business, and from reports, the young men have a bright and prosperous future before them.

TORONTO VISITOR

Mr. Russell Wright, the secretary-treasurer of Messrs. Noble & Rich, sanitary and heating engineers, was a visitor in Toronto last week. Mr. Wright is a great booster for technical education. He and a friend, one of the staff, visited the Toronto Technical School and was very pleased with what he saw. He is also interested in no small degree in the apprentice problem.

SPLENDID TRIBUTE TO A PLUMBER

Saskatoon was the home of the late Sgt. Hugh Cairns, that is, the home of the flesh. But his soul, his spirit, belonged to his motherland, England. And for her he laid down his body and paid the supreme sacrifice. Oh, that mother call, 'tis sweet, and when the war broke out 'twas earnest, and it was heard; yea, heard from the uttermost part of the earth.

Many have wondered how England could draw forth her sons so. But she did, and did it quick. Britannia mourns her heroes now at rest in the flesh, but she is proud of that spirit which lives in the millions left and yet unborn.

Sgt. Hugh Cairns, D.C.M., V.C., a lad of 21 summers, was born in 1897, and made his home in Saskatoon about 7 years ago, learned the plumbing trade and was just about to take his final examination for entrance on the roll of licensed plumbers when he felt the call from "over there" and joined up. He served his time with the Northern Plumbing Co., Saskatoon, under the late Fred Halpenny, whose death was reported in a recent issue of SANITARY ENGINEER.

The accompanying poem was written by one of his friends and reflects great credit both to the author and the hero. No grander sentiments could be expressed:

CHANGE OF ADDRESS

Walter Hill, sanitary engineer, Toronto, has moved from 1231 Dundas Street West to 788 College Street. Mr. Hill hails from England and knows his business from A to Z, having learned his trade in the Old Country. He is a subscriber to Sanitary Engineer and believes in executing work in a practical manner. Many strange installations have been related to SANITARY ENGINEER that do not by any means reflect credit to the trade as a whole.

TO SERGEANT HUGH CAIRNS, D.C.M., V.C.

(A Tribute From a Friend)

Where brooding winds the haggard branches wave,
A little group of wooden crosses stand;
And one there is among them, I would crave
The honor but to touch, with "Friendship's" hand.
Sorrow is tearless, when the happy dead
Can still unfold sweet mem'ries from the tomb;
To ope like flowers, and fragrant virtues shed
Into the hearts, their passing fraught with gloom.
And, so it is with thee, no tears could rise
To dull the gleam of "Love" and "Honest" pride;
For I have known thee, looked into thine eyes,
And felt the "Friendship" thou to none denied.
If ought I feel, 'tis envy of thy death,
To hold "Life's" cup filled with the "Victor's" wine,
To know its subtle lure, yet in a breath
To fling it down unquaffed, at "Freedom's" shrine.
But thou wert England's, and the sea-girt land
That cradled thee, had wrought into thy soul
The sternness of the cliffs that guard her strand,
The faith and strength that "Death" could ne'er control.
Thou hadst much to live for—yet "Honor," "Fame,"
Were laid aside as naught, as things too frail
To bind thy soul when "Duty" called thy name;
Thus, "Britain" lives, and "Freedom" could not fail.
No voice of human praise, no song elate,
May find thine ear in thy unsearched retreat;
Yet "Friendship's" heart, from "Earth's" dark prison gate,
This token gives, in language all unmeet.

FRED. H. BAILEY.

SMOOTH-ON BOOK

The Smooth-On Manufacturing Co. Newark, N.J., are distributing to the trade a very useful instruction book describing the various kinds of repairs that can be effected by the use of their product, as well as making regular joints in pipes, etc. It is pocket size and contains nearly 150 pages of valuable information. A postal card to above address will procure a copy of this book.

LETTER FROM SASKATOON

Editor SANITARY ENGINEER: You, no doubt, will be interested to receive a few lines about some of the boys who went "over the top" from Saskatoon, and have some of them returned, as well as those who have paid the supreme sacrifice.

Our city trouble man, Dick Streak, was away 3 years and 9 months, and was wounded and invalided home, arriving at the end of last year. We are glad to have him on duty again at his old job. Everybody likes Dick, he is true as steel and well liked by most of the old guard of plumbers that were working here in the first half of this decade He comes of a family of plumbers in London, England, his father being in business for many years. He has lost two or three of his brothers in the war.

There has also been a number of other plumbers returned to us recently. Alex. Ritchie, Sergt. E. J. O'Reilly, locally known as "Ted Riley," were both wounded in the fighting last April with the Strathcona's Horse; whilst Ed. Cairns, Chas. Miller, Alf. Clark and W. W. Smith left their bones in France.

I am glad to learn the Government has decided to let our boys come home; some of them have been "over there" since soon after war was declared. Bob Taylor, brother to our plumbing inspector,

is still away, having gone over with the original Princess Pats.

During the flu epidemic there was one splendid worker who volunteered to help stamp out the "flu." I refer to Ab. Brown, the representative of the Dominion Radiator Co. in this district. He was a very active worker, and the boys were sorry to see that he afterwards became afflicted with the disease. He is recovering slowly, but does not seem very robust yet.

I will keep you posted on local news from time to time.

HORACE NIXON.

REMOVING IRON RUST FROM CONCRETE

A solution of hydrochloric acid and stannous acid will remove iron rust from concrete, and will not injure the concrete if the treatment is administered rapidly and the face immediately washed with clean water. The solution mentioned has an affinity for carbonate of lime, consequently it should not be used where hydrated lime has been incorporated in the mixture. Rough finished cement stucco should be treated by spraying with the above solution, as the result will be more thorough and the work more rapid than by the use of a brush. —M. M.

C. A. DUNHAM COMPANY'S ANNUAL CONFERENCE

The C. A. Dunham Company, Limited, whose organization has grown considerably during the period of the war in spite of diminished building activity, held a sales conference during the past week at the Head Office, Toronto, where the company's plans for this year were disclosed.

The manager of each branch sales office was present from Halifax, Ottawa, Toronto, Winnipeg, Calgary and Vancouver.

The company is preparing to extend their plant this spring to meet the increased demands for their specialties.

Wave of Optimism For Canada's Future

Canada Metal Company's Seventh Annual Sales Convention—President Looks For Big Development in Canada

ON Monday, January 20, the seventh annual convention of the Canada Metal Co., Ltd., was opened and a sale-staff of thirty were congregated round the board when Mr. Harris, Sr., president of the company, welcomed the staff to the convention.

Referring to business of the past year, Mr. Harris stated that it was remarkable," and yet there is no reason why 1919 should not be greater in its trade expansion, not only for our own firm, but for every Canadian manufacturer who will determine to go after the business and take advantage of opportunities presented."

Continuing, Mr. Harris stated, "one of our leading financial houses recently sent out a circular broadcast which expresses my sentiments exactly, for I am a firm believer in Canada and its future." The reasons given for expecting a period of exceptional prosperity in the Dominion were as follows:

"The stage is set in Canada for a period of development, the like of which has never been known in the history of the Dominion. The nation is building ships that will carry Canadian products to every country in the world. The steel industries are being equipped on a scale that should, before long, make Canada independent of imported supplies. The big consuming markets are becoming more dependent each year on Canada for pulp and paper supplies, and this country is, physically, in a position to provide for the world's requirements indefinitely."

Mr. Harris, Jr., vice-president, presided, and in going over the annual report of sales of each salesman, said that it was most gratifying to see the progress made in 1918.

In 1917 the company's sales established a record, but 1918 was far ahead. Not only had the branches made considerable progress, but large business had been done with Australia, New Zealand, South Africa, and other distant parts of the British Colonies.

"Our convention," Mr. Harris, Jr., continued, "will be devoted to going thoroughly into our various lines, so that salesmen can gain a greater knowledge of the goods they are selling."

Prizes Presented

The presentation of the prizes was very interesting, and Mr. Martin, in Toronto, when he received his cheque for the first prize in general sales, was like Niobe—all smiles. Mr. White, of Winnipeg, made a good second. Mr. Parkin was the one to put the Ham in Hamilton and received a beautiful diamond ring for the first prize in the Harris heavy pressure babbitt metal competition.

In this competition, Mr. Hughes, Toronto, was second.

Salesmen had been encouraged to send in questions to be answered in reference to all metals, or anything associated with the metal industry, and one morning was devoted to taking up such questions.

At noon each day, lunch was served at the Humber Bay Inn, and the trip along the lake shore made a most enjoyable break in the proceedings. Monday evening there was a smoking concert in the convention hall.

At the conclusion of the convention, a hearty vote of thanks was accorded to Mr. Harris, Sr., Mr. Harris, Jr., and Mr. H. C. Crow, for the excellent way in which everything had been prepared and carried out, and in reply Mr. Crow stated that he hoped that each salesman had gained a little more knowledge of the goods manufactured by the company and that they would be able to assist everyone interested in the metal business with any difficulty which might arise, and that the motto for each one be: "We will be satisfied with nothing short of perfection."

MEMBERS IN ATTENDANCE AT DURHAM CONFERENCE

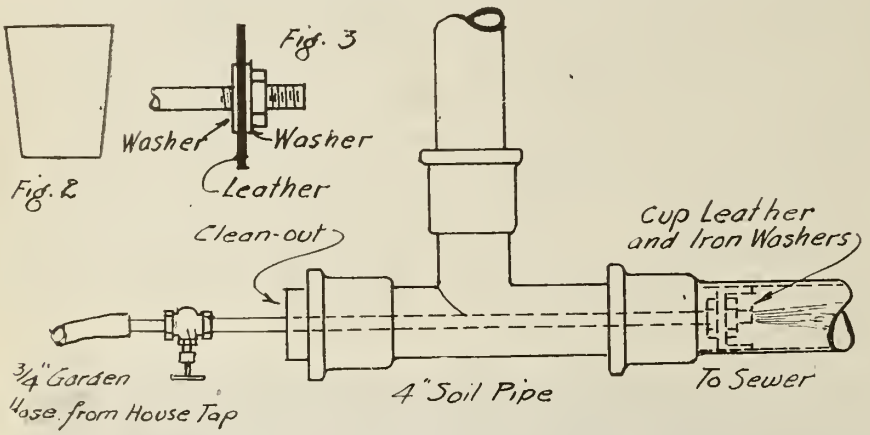
Top Row—Left to Right: R. F. Eagar, Halifax; E. T. Flanagan, Toronto; A. Kastello, Montreal; W. H. Baldwin, Toronto; J. R. Estey, Calgary. Bottom Row: J. H. Shaver, Ottawa; A. J. Dickey, Gen. Manager; J. Sully, Jr. Asst. Sales Mgr.; M. W. Shears, Asst. Engineer.

Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published--Description of Jobs Done or Shop Kinks Are Also Invited.

CLEANING SEWER

By J. E. NOBLE

A few days ago I was watching a plumber trying to clear an obstruction from a 4-inch sewer pipe. His method was to run the end of a hose into the end tee, after removing the clean-out cover, and plugging rags or clothes around the hose to prevent the water backing out. Why will men use such crude methods when a few minutes' work will supply them with a really good tool for this style of a job? An idea of the tool can be formed by a glance at the sketch; I used this tool with fine success when I worked at the plumbing business as long as twenty years ago (perhaps I should use modern terms and call it sanitary engineering, but from personal observation the old plumber is "in it" to the neck with the sanitary engineer, in numerous cases at least). It is nothing more or less than a cup leather held on the end of a piece of ¾-inch iron pipe by two iron threaded washers, the other end of the pipe being attached to a hose, which in turn is coupled to one of the house taps. A valve can be placed on the end of the pipe so that the flow of the water can be controlled without going to the other tap. To make cup leathers, form a piece of sheet tin or galvanized iron in the form shown at Fig. 2, size on top 6½ inches, bottom 4 inches; this will do for cup leathers 6 in. to 4 in. To make the cup, cut the leather 2 in. over the size required; that is, for a 4 in. cup make the leather size 6 in. Now place the leather between two iron washers and bolt them together as in Fig. 3. Next, place it in a dish of warm (not hot) water for a few minutes, this will soften up the leather. Next remove from the water and force down into the form, Fig. 2, and leave there for half an hour or so until the leather gets time to set into shape. This makes as good a cup leather as can be bought. Of course judgment must be used in picking your leather; use a piece of firm, flexible leather, sole leather is too hard, and belly leather too soft; use side leather.



ARRANGEMENT USED IN CLEANING OUT OBSTRUCTED SEWER.

GETTING A REAL DRAFT

A good draft is one of the most essential things about a boiler plant, and special attention should therefore be paid to it when the plant is laid out. It is easy to cut the draft down if it is too strong, but if it is too feeble the owner of the boiler is faced by a serious situation. The value of a powerful draft is particularly appreciated when some emergency makes it necessary to force the boilers beyond their normal capacity for a time. A strong draft also makes it feasible to burn relatively cheap and low grade fuels.

RADIATOR PROBLEM

I HAVE been asked to change over a hot water job to steam. The hot water systems are installed in five houses at present, all are detached, with about 6 feet space between each house. And the furnaces are all too small. Can I use the same pipes? The owner has been advised to make one central heating steam plant, but has been told that while it may be possible to use some of the piping, the returns would all have to be taken out and the flow pipe connected at the top of the radiator. It seems to me that this is going to be a very expensive job,and if you can suggest a less expensive way, or overcome having to disturb the radiation and the piping, the owner would I believe, be much better impressed. He is of the opinion that he can rent the houses for more money if he furnishes heat and has a man around to clear up a little round the buildings, and further he has a man from the war who can just look after this equipment; and is quite willing to build a separate central heating plant. Any advice on the problem will greatly oblige.

CENTRAL HEATING.

It would have been much more interesting if "Central Heating" had sent in a rough sketch of the work under consideration, but in the absence of such sketch we will advise as best we can. In the first place, had the job been in the first place a number of steam installations, we would have advised a central source of steam service, by taking all the small furnaces out and erecting a large central plant. But as it is a hot water proposition, and the owner would like to have the houses left undisturbed as much as possible, we would advise as follows:

First, take out all the small furnaces and install in their place a type of steam hot water heater such as the "Sims," the "Manny," the "Patterson," the "Alberger," or the "Ross."

Next connect these up to the new

Continued on page 30

MUELLER

Compression Sink Bibbs

SIMPLE elegance, combined with superior strength and wearing quality, is what you give your customer when you install **MUELLER** goods.

The many advantageous features of **MUELLER** compression bibbs give maximum service from the bibb as a whole. The anti-spreading device that breaks up the whirling motion of the water and the corrugated stem and handle, allowing the handle to be set at any angle without becoming loose or wobbly, are only two of these features.

MUELLER Bibbs are the best the market affords. Write for prices.

H. Mueller Mfg. Co., Limited

SARNIA CANADA

MUELLER

THE QUESTION BOX

Continued from page 28

steam central heating plant. Each main steam supply as it enters each building should be fitted up with a thermostatic temperature controlling valve, so each house would be under proper control, and the temperature in the house kept at a uniform heat. Tons and tons of coal, or whatever fuel is used, would be saved. If oil, of course, it would be gallons, not tons.

There need be no alterations made to the system of hot water pipes, nor would the radiation require to be disturbed. It would, however, be a very good thing to place a temperature booster or heat generator on each job, so as to be able to assist the water in the system to absorb all the steam units furnished.

There is another question which would have to be considered, that of being sure that a head of steam of sufficient pressure would need to be maintained so as to make sure of the already fixed quantity of hot water radiation would be enough to heat the houses. If our inquirer will send in a sketch of the proposed job, we will be pleased to render any service we can. In conclusion we may say that we would not advise turning the actual radiation and piping already installed into a straight steam job, neither separately or centrally.—Editor.

Trouble with Rust in Water

Editor Sanitary Engineer.—I have installed a number of pneumatic water systems and until just lately I have had no complaints. One job was not so bad, but I tried to remedy matters by pumping some pipe cleaning compound through the pipes and tank and then running all the water off. This job is worse than ever now, in fact, the scale in the pipes is now causing trouble with the valves in the pump. Can you suggest a remedy? Another job I am having trouble with, the water appears to be a slight greyish color, red at times only. I dare not touch this job for fear of making matters worse. The peculiar thing about these jobs is that they are the only ones I am as yet having trouble with. For example, I installed a couple of jobs over 12 years ago and they are working fine. The people say that they are working and giving better service than they did when first installed. Any information will be appreciated.

PUMP TROUBLE.

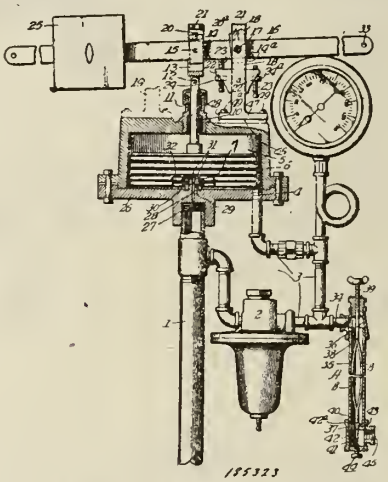
If our correspondent will send in his name and furnish more information regarding kind of well or source of water, whether water is charged with lime or vegetable matter, we will be able to give some decision as to the cause of trouble. It may be that the suction pipes are black, and galvanized wrought iron pipe should be used. Further, there may be some foreign matter percolating into the source of water supply. One thing we would strongly advise and that is that samples of the water be sent to the provincial health department to be analyzed. —Editor.

CANADIAN PATENTS

No. 185,323

The National Regulator Company, assignee of John M. Larsen, both of Chicago, Illinois, U.S.A., 2nd July, 1918; 6 years. Filed 5th June, 1916. Receipt No. 266,302.

Claim.—1. In a device of the class described, an operating lever, a source of pressure adapted to actuate same, a diaphragm casing, a plurality of diaphragms within said casing, a stem mounted on said diaphragms and connected with said lever, means for admitting pressure within said diaphragms, means for admitting pressure within said diaphragm casing outside of said diaphragm, a reducing valve interposed between said source of pressure and the diaphragms casing, and means for relieving the pressure within said diaphragm casing outside of said diaphragms, and a reducing valve interposed between said source of pressure and the diaphragm casing.



No. 185,323. Pressure Regulator.

2. In a device of the class described, an operating lever, a source of pressure adapted to actuate same, a diaphragm casing, a plurality of diaphragms within diaphragms, means for admitting pressphragms and connected with said lever, a shiftable fulcrum for said lever mounted on said diaphragm casing, means for admitting pressure within said diaphragm casing.

3. In a device of the class described, an operating lever, a source of pressure adapted to actuate same, a diaphragm casing, a plurality of diaphragms within said casing, a stem mounted on said diaphragms and connected with said lever, a shiftable fulcrum for said lever mounted on said diaphragm casing, means for admitting pressure within said diaphragms, means for admitting pressure within said diaphragm casing outside of said diaphragms, a reducing valve interposed between said source of pressure and the diaphragm casing, and means for relieving the pressure within said diaphragm casing.

4. In device of the class described, an operating lever, a source of pressure adapted to actuate same, a diaphragm casing, a plurality of diaphragms within said casing, a stem mounted on said diaphragms and connected with said lever. a shiftable fulcrum for said lever mounted on said diaphragm casing, a plurality of stops mounted on said fulcrum whereby the upward and downward movement of said lever in either direction may be regulated, means for admitting pressure within said diaphragm casing outside of said diaphragms, and a reducing valve interposed between said source of pressure and the diaphragm casing.

5. In a device of the class described, an operating lever, a source of pressure adapted to actuate same, a diaphragm casing, a plurality of diaphragms within said casing. a stem mounted on said diaphragm and connected with said lever, a shiftable fulcrum for said lever mounted on said diaphragm casing, a plurality of manually adjustable stops mounted on said fulcrum whereby the upward and downward movement of said lever in either direction may be regulated, means for admitting pressure within said diaphragm casing outside of said diaphragm, and a reducing valve interposed between said source of pressure and the diaphragm casing.

6. In a device of the class described an operating lever, a source of pressure adapted to actuate same, a diaphragm casing, a plurality of diaphragms within said casing, a stem mounted on said diaphragms and connected with said lever

WINNIPEG PLUMBING DIVISION FOR MONTH OF JANUARY

Permits Issued

46

Inspections

Water Tests	Smoke Tests	Subsequent Inspections	Miscellaneous Inspections	Defects Rectified
47	67	272	18	186

Sewer Division

Permits issued	Connections constructed	Inspections
4	2	28

Sewer Maintenance Division

Tank Flushings Gallons	Hose Flushings Gallons	Total Gallons of Water Used
1,546,240	715,000	2,261,240

THE "MORRISON" AUTOMATIC CELLAR DRAINER

For ease of operation and simplicity of construction this cellar drainer has no equal.

Easy to install.
Takes up little space.
All working parts above water.
Dirt does not get into moving parts.

All troubles vanish after a "Morrison" has been installed.

Goods in basement storage are safe from damage.
Building foundations are protected.

Fifty years' experience in the manufacture of Plumbing and Heating supplies is back of the "Morrison." May we show you how to increase sales and earn splendid profits by selling them?

Write us to-day.

The James Morrison Brass Manufacturing Company, Limited
93-97 Adelaide St. West, Toronto, Ont.

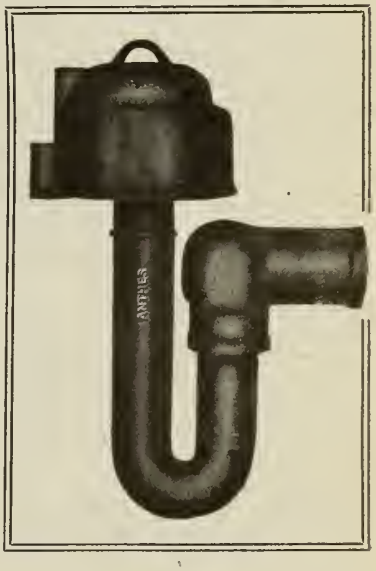
A Syphon Is The Heart Of a Sanitary Septic Tank— *Anthes Syphons Are Faultless!*

Regular and intermittent discharge in connection with the sewage system is absolutely necessary or the system installed is a failure.

Anthes Syphons and Soil pipes have no superior for permanence, quality and price.

Anthes Syphons are unconditionally guaranteed. We manufacture a full line of cast iron pipe fittings at both our plants.

Ask your jobber for "Anthes" Syphons, soil pipe and fittings.



ANTHES FOUNDRY, LIMITED

TORONTO and WINNIPEG

Classified Buyers Guide

Occasionally advertisements are inserted in the paper after this page has gone to press. The insertion of the Advertiser's name on this page is not part of the advertising order, but is inserted solely for the convenience of the reader of the paper

AIR RECEIVERS

Wm. B. Scaife & Sons Co., Oakmont, Pa.

AIR LINE SYSTEMS

C. A. Dunham Co., Ltd., Toronto.
Canadian Powers Regulator Co., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

AIR VALVES

Beaton & Cadwell Mfg. Co., New Britain, Conn.
Beaton & Corbin Mfg. Co., Southington, Conn.
Canadian Wolverine Co., Ltd., Chatham.
Canadian Powers Regulator Co., Toronto.
C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.

ASBESTOS GOODS

James Morrison Brass Mfg. Co., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.
Canadian H. W. Johns-Manville Co., Toronto.

BOILERS, STEAM OR HOT WATER

Lord & Burnham Co., Ltd., Toronto.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.

BOILER FEED REGULATORS

Empire Mfg. Co., London and Toronto.
C. A. Dunham Co., Ltd., Toronto.
James Morrison Brass Mfg. Co., Toronto.

BRASS GOODS, VALVES, ETC.

Joseph Breeden & Co., Ltd., Birmingham, Eng.
Canadian Brass Co., Ltd., Galt, Ont.
Canadian Wolverine Co., Ltd., Chatham.
C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Limited, Galt.
James Morrison Brass Mfg. Co., Toronto.
Kerr Engine Co., Ltd., Walkerville.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.
G. & W. G. Gummer, Ltd., Rotherham, Eng.

BRASS PIPE AND TUBE

Canada Metal Co., Ltd., Toronto.
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

CELLAR DRAINERS

Galt Brass Co., Limited, Galt.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

CHAIN WRENCHES

Trimont Mfg. Co., Roxbury, Mass.
J. H. Williams Co., Brooklyn, New York.

CLOSETS

Canadian Brass Co., Ltd., Galt, Ont.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Limited, Galt.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Standard Sanitary Mfg. Co., Ltd., Toronto.

COUNTRY RESIDENCE EQUIPMENTS

Empire Mfg. Co., Ltd., London and Toronto.
Hurley Machine Co., Toronto.
National Equipment Co., Ltd., Toronto, Ont.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

DAMPER REGULATORS

Canadian Powers Regulator Co., Toronto.
C. A. Dunham Co., Ltd., Toronto.

DRAINAGE FITTINGS

Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

DRINKING FOUNTAINS

Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

EJECTORS, STEAM

James Morrison Brass Mfg. Co., Toronto.
Kerr Engine Co., Walkerville.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

ENAMELWARE

Amherst Foundry Co., Ltd., Amherst, N.S.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Limited, Galt.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Standard Sanitary Mfg. Co., Ltd., Toronto.
Port Hope Sanitary Mfg. Co., Ltd., Port Hope.

ELECTRIC PUMPING MACHINERY

Empire Mfg. Co., Ltd., London and Toronto.
Hurley Machine Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
National Equipment Co., Ltd., Toronto, Ont.

EXPANSION TANKS

Wm. B. Scaife & Sons Co., Oakmont, Pa.
Toronto Hardware Mfg. Co., Ltd., Toronto.

FITTINGS

Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

FILTERS (WATER)

Wm. B. Scaife & Sons Co., Oakmont, Pa.

FLUSHOMETERS

Canadian Brass Co., Ltd., Galt, Ont.
Canada Metal Co., Ltd., Toronto.
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Standard Sanitary Mfg. Co., Ltd., Toronto.

FLOOR AND CEILING PLATES

Beaton & Cadwell Mfg. Co., New Britain, Conn.
Beaton & Corbin Mfg. Co., Southington, Conn.
Canadian Wolverine Co., Ltd., Chatham.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Empire Mfg. Co., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
Steel & Radiation, Ltd., Toronto.

GASOLINE ENGINES

Empire Mfg. Co., Ltd., London and Toronto.
National Equipment Co., Ltd., Toronto, Ont.

GASOLINE ENGINES

Empire Mfg. Co., Ltd., London and Toronto.
National Equipment Co., Ltd., Toronto, Ont.

GAS WATER HEATERS

Empire Mfg. Co., Ltd., London and Toronto.
Hotstream Heater Co., Cleveland.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Pittsburg Water Heater Co., Toronto.
Rudd Manufacturing Co., Toronto.

HEAT GENERATORS

Galt Brass Co., Galt, Ont.
James Morrison Brass Mfg. Co., Toronto.

HEATERS

Lord & Burnham Co., Ltd., Toronto.
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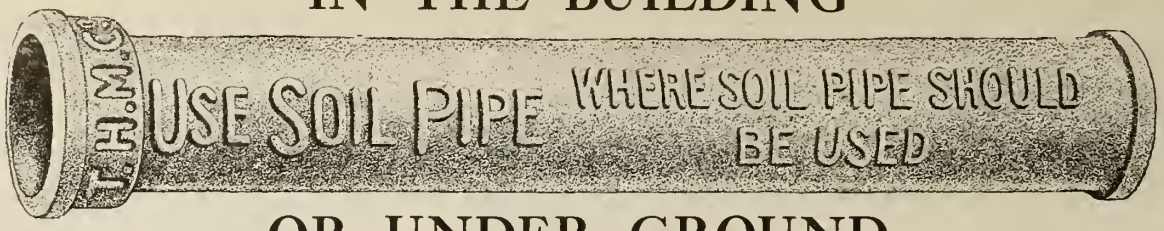

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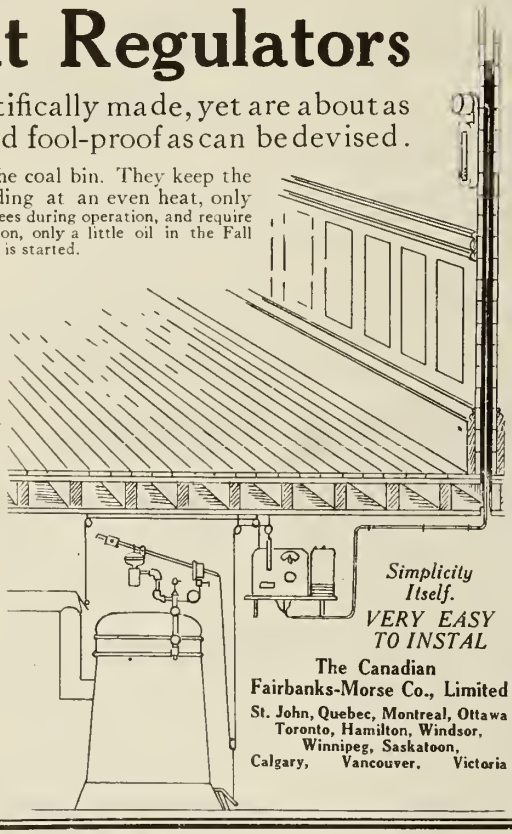

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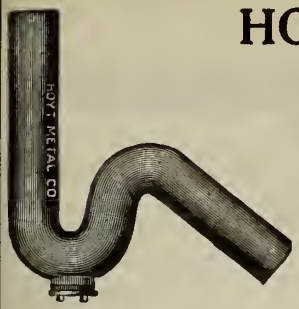

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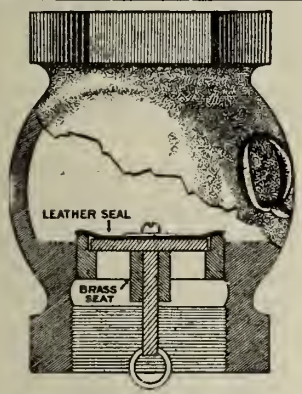

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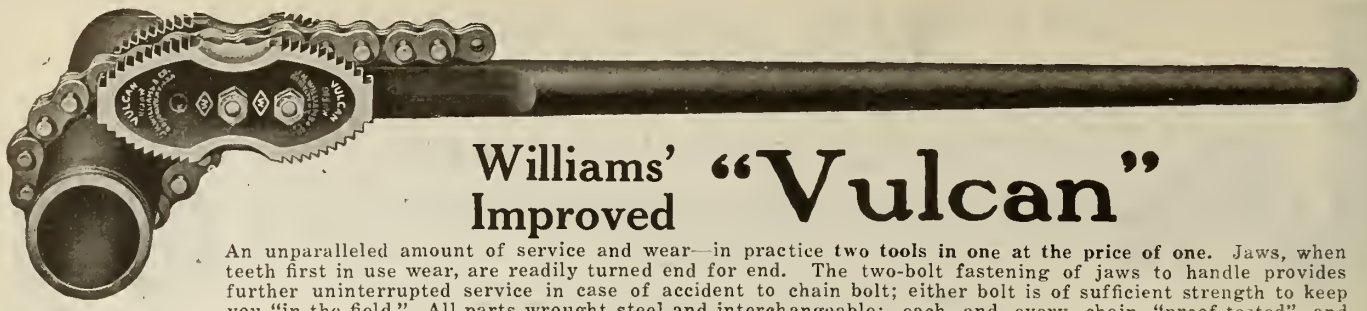

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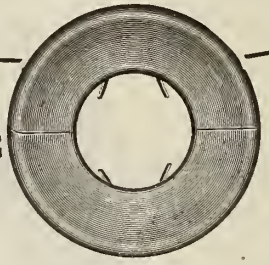

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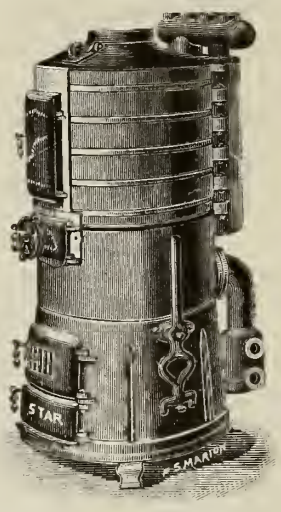

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ADVERTISING INDEX

A. & J. Mfg. Co. 40
Amherst Foundry Co.....Inside Front Cover
American Technical Society..... 38
Anthes Foundry Co. 31
Beaton & Cadwell 36
Beaton & Corbin 40
Belanger, O., Regd. 36
Borden Canadian Co. 40
Canadian Fairbanks-Morse Co. 34
Canadian Powers Regulator Co. 4
Canadian Tube & Iron Co. 36
Canadian Wolverine Co. 5
Canada Metal Co. 2
Chamberlain Desolvo Co. 5
Consumers Metal Co. 40
Dart Union Co. .....Inside Back Cover
Empire Manufacturing Co. .....
Outside Front Cover
Galt Brass Co. .....Back Cover and 9
Goodwin, F., Co. 4
Gummer, G. & W. G., Ltd. 1
Hause Mfg. Co., Chas. F. 40
Hotstream Heater Co. 39
Hoyt Metal Co. 35
International Malleable Iron Co. 7
Jardine, A. B., & Co. 7
Katie Foundry, The 6
Kerr Eng. Co., Ltd.....Inside Back Cover
McDougall & Co., R. 35
McIntyre & Taylor, Ltd. 35
Moline Heat Co. 38
Morrison Brass Mfg. Co., Ltd., Jas. 31
Mueller Mfg. Co. 29
Port Hope Sanitary Mfg. Co. 10
Scaife & Sons Co., Wm. B. 35
Simplex Manufacturing Co. 46
Standard Sanitary Mfg. Co. 3
Steel & Radiation, Limited 39
Trimont Manufacturing Co. 34
Toronto Hardware Mfg. Co. 34
Wallaceburg Brass & Iron Co. 6
Warden-King, Limited 33
Williams, J. H., & Co. 36
X Laboratories 37

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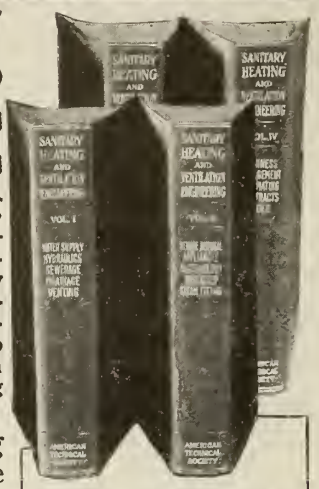

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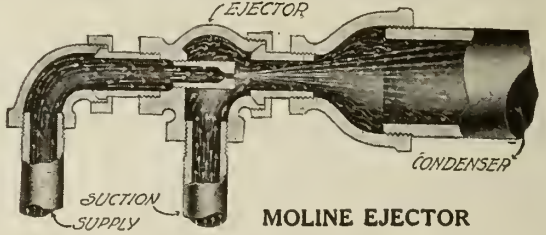

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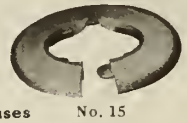


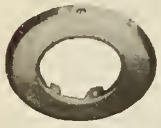
No. 15

Puts just the right finish on that heating job

Send for catalog of complete line of "B. & C." goods.

No. 1 Valve

Stock carried by our Canadian Representative
W. H. CUNNINGHAM & CO.
183 Church Street
Toronto, Ont.

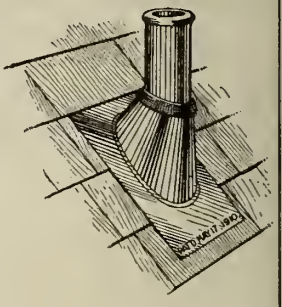


No. 16

No. 17

The Beaton & Corbin Mfg., Co.
Southington, Conn., U.S.A.
The Old Original Company

The **SIMPLEX** Adjustable **Roof Flange**



Fits any roof from ½ pitch to flat—just slide it down the pipe and it will conform with the pitch of the roof.

Trade Price 2" $1.00 4" $1.15

Made in all sizes—For sale by nearly every jobber

Simplex Mfg. Company - Chicago, Ill.
183 Church St., TORONTO, ONT.
Canadian Representative: W. H. CUNNINGHAM & CO.,

Second-Hand Pipe

1-2" to 4"

Black and Galvanized

Send us list of your requirements

Consumers Metal Company, Limited
14 St. John Street — MONTREAL
Works: — LACHINE, QUE.

SAVE YOUR COUPLINGS

Write us what you have of the various sizes, either in pieces or pounds, and we will make you a cash price on them.

The A. & J. Mfg. Company
559 West Lake St. — Chicago, Ill.

"HAUSE" PIPE JOINT CEMENT

For steam, water, air, oil, gas, gaskets, etc. The cement that cements. Sets like gum. Allows no leaks.

The Great Value of "HAUSE PIPE JOINT CEMENT" lies in its peculiar chemical properties which permits of its hardening and expanding after the joints are made up. In making up joints it has the same effect as a lubricant on the best graphite, and while the joints may be made and broken readily, a perfectly tight joint is maintained at all times. Comes in 1-lb., 5-lb., 15-lb., 25-lb., 50-lb. cans, 100-lb. barrels. Manufactured in ready mixed and powder form. Ask your jobber for prices, or write us direct.

Made in Omaha, Neb., U.S.A.

Manufactured in Ready Mixed and Powder Form.

Canadian Distributors:

Empire Manufacturing Co., Limited
LONDON and TORONTO

Kindly Mention

Sanitary Engineer

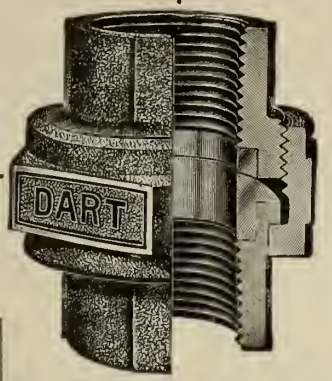
When Writing to

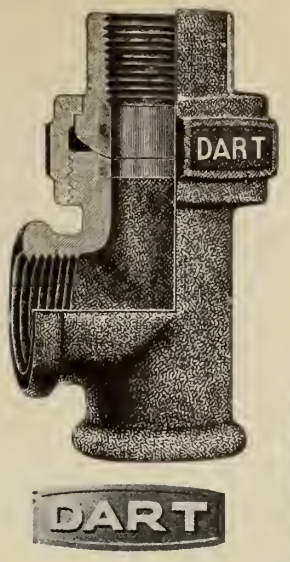
Advertisers

Face and Seat are BRONZE

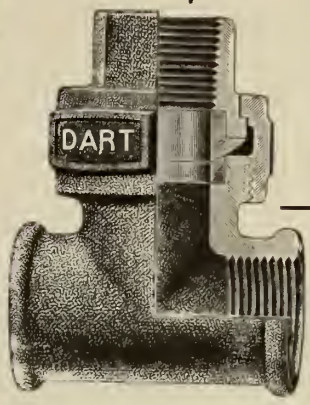
There is no deterioration of any kind at the point where the joint is made.

Tee Union on the run (Female)



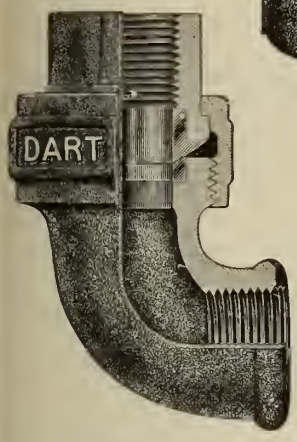


Tee Union on the outlet (Female)



Iron Parts are Heavy

They positively prevent stretching, splitting or pulling apart under strain or heavy pressure



Union Elbow (Female)

DART UNIONS

are Easy to use

They make a sure joint every time regardless of the alignment of the pipe so long as the nut can be started on its thread. Dart Unions save much time, bother and worry and they will never loosen up and leak in service. They'll make your good work last.

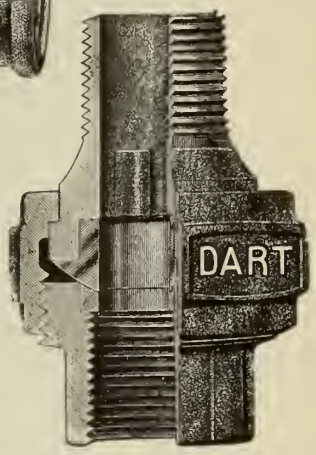
Made in a variety of styles to fill all requirements.

SOLD BY ALL JOBBERS

Manufactured and Guaranteed by

DART UNION COMPANY, Limited

TORONTO, CANADA



Male and Female Union

KERR GATE VALVES

I. B. GATE

These Iron Body Gate Valves were designed and are made by US to meet YOUR demand for strong, substantial, interchangeable valves, with a "nobby" appearance.

They meet the requirement and more. When they get us a customer they hold him.

Who in the Steamfitting trade has not heard of and used Kerr's (Weber) Brass Gate Valves? We say "Kerr's"—not the imitations. We make this valve of uniform material, and they stand up to the work given them, just as they always have. Some have tried others, but they came back to the tried and trusty old "Weber Gate" made by Kerr. What is a few cents on a valve, when you can get one like the genuine "Weber"?

Have you our Catalogue No. 5?
If not, we will mail you one.
A postal to-day will bring it.

BRASS GATE

THE KERR ENGINE COMPANY, LIMITED

WALKERVILLE, ONTARIO

EVERY FITTING TESTED

Think of it!

Twelve Years without a leak

EVERY TANK GUARANTEED

Vitro Tanks that were installed ten years ago are still going strong without sign of the first leak.

Surely this fact is sufficient evidence that tank troubles have been successfully overcome.

In the construction of the Vitro all chance of trouble is avoided by eliminating those features which in other tanks cause trouble. The vitro is all in one piece with no joints to open up and no linings to leak.

Installing Vitro No-Trouble Tanks is a mighty profitable way of building a permanent, satisfactory business. It gains for you a reputation for reliable, honest work that is well worth while.

MADE-IN-CANADA

Join us in our success by specifying VitrO No-Trouble Tanks when placing your next order of goods with your jobber.

Galt Brass Company, Limited

Galt, Canada

SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

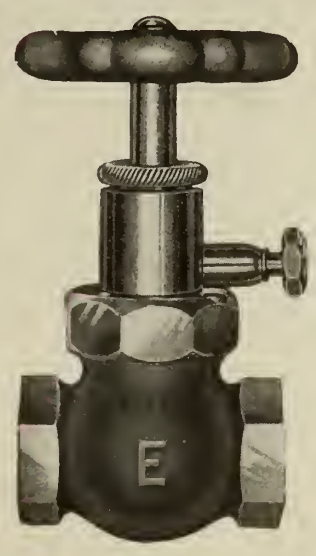
Vol. XIII. Publication Office, Toronto, March 1st, 1919 No. 5

HAVE YOU TRIED THIS LINE

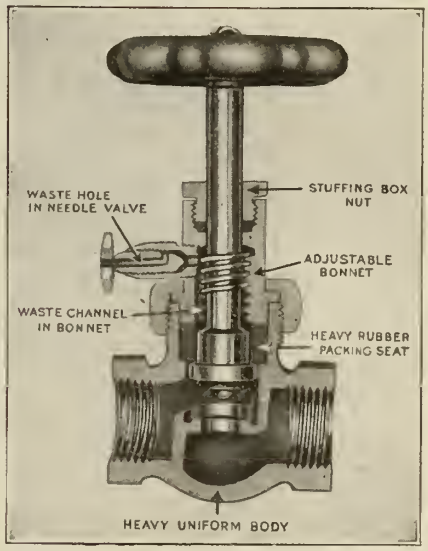
EMPIRE

Compression Stop and Waste Cocks are becoming more popular every day, which means that they are made right.

Inside or Outside



It's a Dandy



EMPIRE

Stop and Waste Cocks are made of a uniform mixture, based upon actual science, and are machined and fitted as accurate as an engine.

When the season of the year comes round for stop and wastes cocks, don't try and tinker with old ones. You will only be wasting time and piling up expense and annoyance for yourself and customer.

Put in one of these improved Empire S and W, and make a real good job if it. At the same time creating an extra sale and giving better service and satisfaction to your customer. It's service that counts.

We can make prompt deliveries. Write us for prices.

EMPIRE MANUFACTURING CO., LIMITED

LONDON TORONTO

SANITARY ENGINEER, March 1st, 1919, Vol. XIII., No. 5, published fortnightly at 143-153 University Ave., Toronto, by The MacLean Publishing Co., Ltd. Yearly subscription price, Canada $1.00; United States $1.50; Great Britain and the Colonies, 1s. 6d.; elsewhere $2.00. Entered as second-class matter at the Post Office Department, Ottawa. Entered as second-class matter July 1st, 1912, at the Post Office at Buffalo under the Act of March 3rd, 1879.

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While

A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for **BEAVER BRAND CAST IRON ENAMEL WARE**

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

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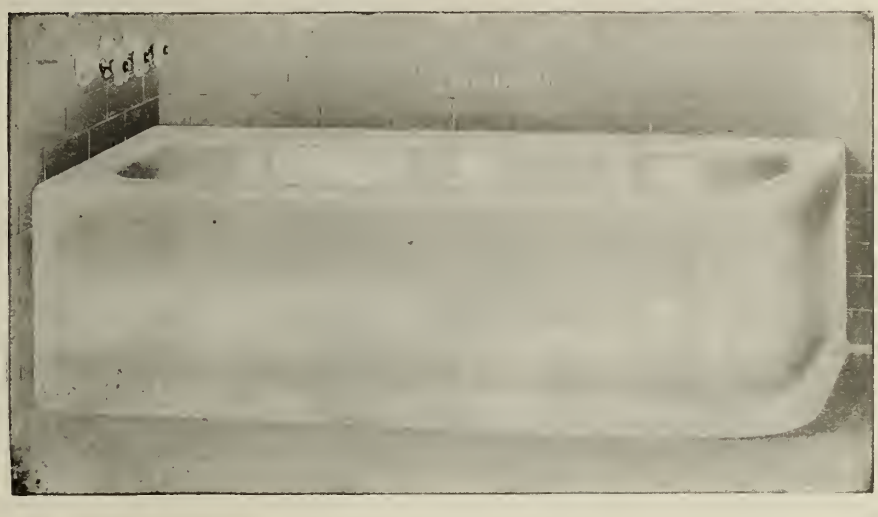
"Standard"
"Perfection" Built-In Baths

Made in One Piece Enamelled All Over



These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners meaning bathroom sanitation.

Made in 5 and 5½ foot sizes.

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Make your plans for coming activity in the building trade

BATHS
LAVATORIES
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LEAD
PIPE
SHEET
LEAD
SOLDER
BLOCK
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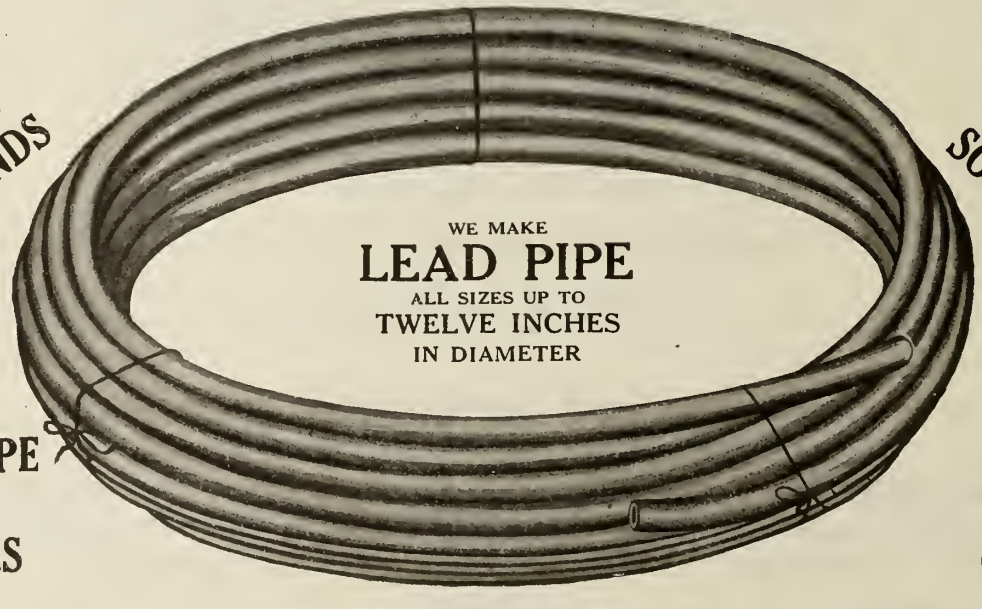
WE HAVE EVERYTHING FOR

THE PLUMBER

CATALOGUE "A" MAILED FREE

TRAPS AND BENDS

EASY WIPING SOLDER



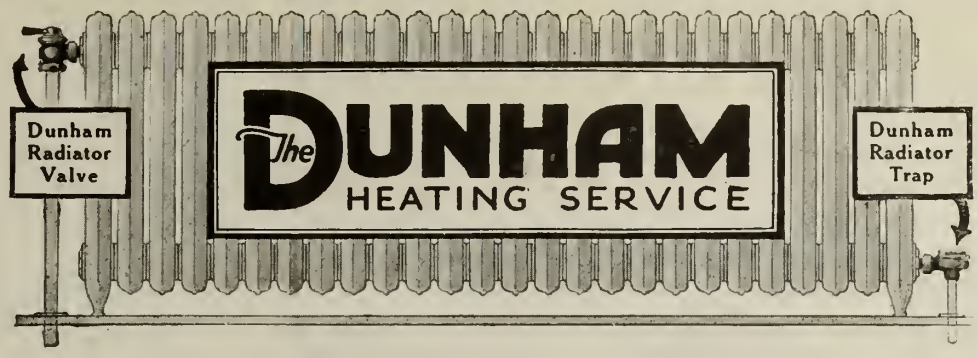
IRON PIPE AND FITTINGS

ALL BRASS GOODS

THE CANADA METAL CO., LIMITED

TORONTO, CANADA

HAMILTON MONTREAL WINNIPEG VANCOUVER



A Timely Service and the Company Behind It

The public wants better steam-heating service—more comfort per ton of coal. This Company is in a most favorable position to meet this demand through its co-workers—the architects, heating and ventilating engineers, heating contractors and builders—to whom it offers practical co-operation that will increase their prestige as well as their volume of business.

Any man who uses, specifies or installs steam-heating equipment will find it advantageous to learn more about Dunham Heating Service—the product of 15 years' knowledge of steam-heating in all its phases.

C. A. DUNHAM COMPANY, LTD., Toronto, Canada

Halifax, Montreal, Ottawa, Winnipeg, Vancouver, Calgary

WE SPECIALIZE IN

PIPE THREADING TOOLS

Take Another Look At This Job

ESTABLISH PEACE

If you desire to establish lasting peace in your shop, you will have to furnish your men with good tools. Men will not do the same amount of work if that work is hard. The more you *INVEST* in tools if they're good tools, the less you will SPEND in labor. To invest is to establish an asset, to spend is to create a liability. Our tools will save you money and make peace in your shop.

ESTABLISH PROFIT

Work made easy becomes a pleasure. Jardine and Toledo Pipe Threading Tools make threading pipe so easy that a boy can thread a 4-inch pipe as easy as he can thread a ½-inch pipe.

Not only so but when a thread is made with one of our tools it's a good thread. No cutting off pieces of pipe. No lost time and no leaks. That's the way to establish a profit on every job.

A. B. JARDINE & COMPANY, LIMITED, HESPELER, ONT.

Sole makers of "Jardine" Pipe-Threading Tools.
Sole licensees to manufacture and sell Toledo Pipe-Threading Tools in Canada.
Agents, Winnipeg and West—Stanley Brock, Ltd., Winnipeg, Man.
Brockville and East—J. R. Devereux, 358 Beaver Hall Square, Montreal.
Belleville and West—W. H. Cunningham & Co., 183 Church St., Toronto, Ont.

How long does house drainage piping last?

This illustration is typical of scores of photographs shown in Dr. Gerhard's paper on "The Relative Corrosion of Cast Iron, Wrought Iron and Steel Pipe in House Drainage Systems", copy of which will be sent on request.

And the Answer—

"While averse to speculating on anything covering a period of 100 years, the writer if asked to make a conservative estimate of the life of black wrought iron vent pipes of the Mail & Express Building, would be inclined to conclude that they would last 100 years or possibly even longer."—Dr. Wm. Paul Gerhard, Mem. A.S.M.E., Hon. Corresponding Mem. American Inst. of Arch.

If you could know that the pipe you are installing in the building you are erecting to-day would last 100 years or longer, you would feel reasonably immune to pipe troubles. Nor would you hesitate to pay a slightly higher cost for such pipe, for it would be far cheaper in the end.

The black iron vent pipes mentioned in the above paragraph, taken from a paper entitled "The Relative Corrosion of Cast Iron, Wrought Iron, and Steel Pipe in House Drainage Systems," presented by Dr. Gerhard at the last annual meeting of the A. S. M. E. were made of genuine wrought iron of the Byers quality—the kind of pipe which Byers have made since 1864 and on which their whole reputation is staked.

A copy of the report covering the complete investigation will be sent on request. It contains detailed records obtained by personal investigation of the vent and drain pipes in over 60 New York sky-scrapers and photographs showing the actual condition of the pipe.

A. M. BYERS COMPANY

Established 1864 Pittsburgh, Pa.

New York Boston Chicago Dallas

BYERS GENUINE WROUGHT IRON PIPE
FULL WEIGHT GUARANTEED

G. & W. G. GUMMER, LIMITED

EFFINGHAM BRASS WORKS, ROTHERHAM, ENGLAND

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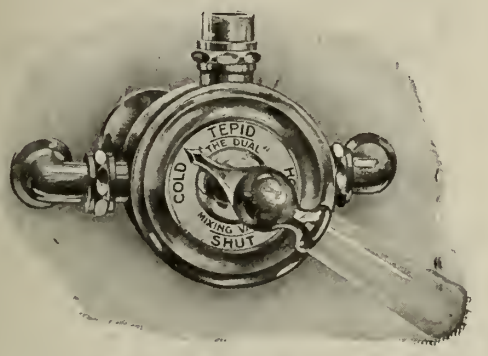


"Dual" Mixer

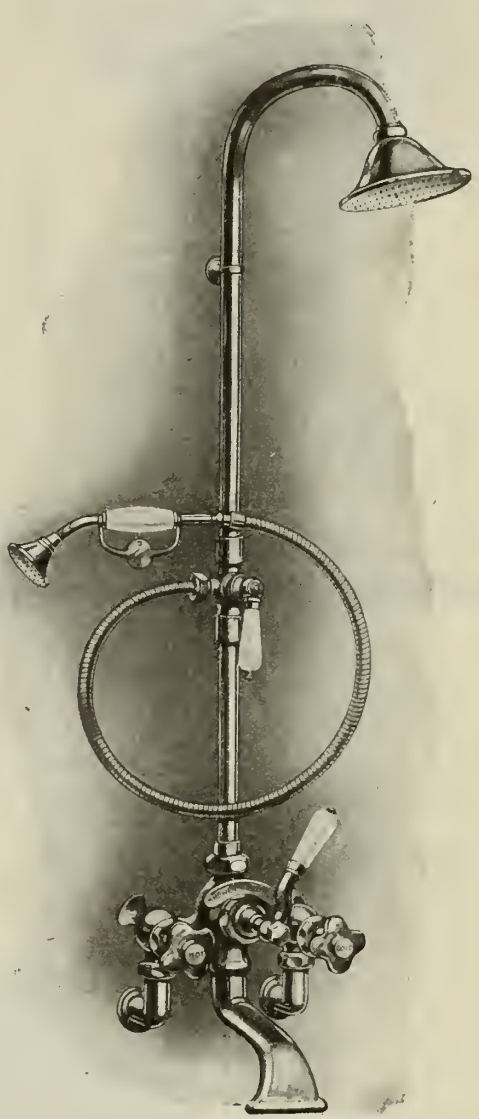
A valve that really mixes Hot and Cold Water, and maintains a uniform mixture.

For ease of operation, simple construction and easy installation, it has set a new standard of efficiency.

Cold Water must be turned on first, no possibility of scalding.

Made in several forms for Showers, Sprays, Operating Rooms, etc.

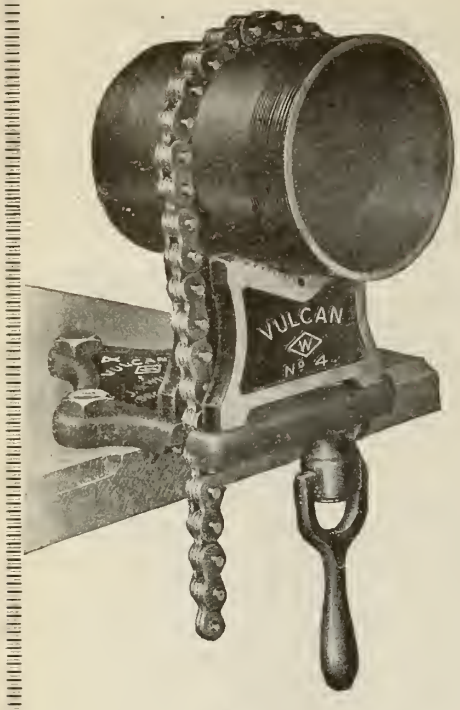
At the well-known works of Messrs. Brunner, Mond & Co. these valves provide baths for 2,500 employees.



G. & W. G. GUMMER, LIMITED

Manufacturers of every description of

Engineers,' Plumbers' and Sanitary Quality Brassware



Williams' "Vulcan"

Drop-Forged

Chain Pipe Vise

MADE entirely of drop-forged and wrought steel, these Vises are unbreakable, compact, rapid in action and positive in gripping pipe. They are attachable *anywhere*—any handy bench, post, or other support will serve. Remember, Williams' Chain Pipe Tools have been *Standard* for nearly half a century—they are all backed by our absolute and unconditional guarantee of service.

Vises in 3 sizes for ⅛ to 8-inch pipe.

Descriptive Booklet on Request.

J. H. Williams & Co.

"The Drop-Forging People"

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First Cost *versus* Upkeep Cost!

The purchase price means nothing if the upkeep cost is not low.

The purchase price of King Boilers is no more than the average boiler and yet—

The consumption of fuel—*the upkeep cost* is lower—considerably lower.

The thin, peculiarly shaped waterways in the "King" mean quickly heated water and perfect circulation, which causes a saving in fuel because it obviates the necessity of "extra firing" to move cold water from the radiators.

The Trade should use this quick-heating, fuel-saving argument now while fuel is scarce and high in price.

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"Any way you like have the best d most efficient pipe cleanser on the market. I've tried them all."

DESOLVO

Our customers are our biggest boosters for Desolvo. They have tried it and know it's right.

Experience counts every time. Once you try Desolvo you will always keep it in stock.

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You Will be Roughing-in Soon

Why not have on hand

Wolverine Waste and Vent Tees

Perfect Threads

Make your work easier and finish on time. See Catalog "C" for list of sizes and other fittings.

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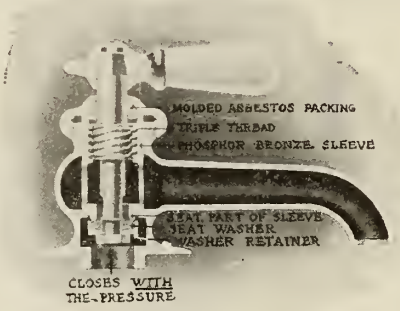
"Quaturn" is the Faucet



Exclusive Features
(Patented)

All you need to do is to put a *Quaturn* alongside an ordinary Bibb or Basin Cock. Then you will notice the fine lines and sturdy structure which will appeal to you as it will to your customers. When they see a *Quaturn* they will want it.

There are many other features about *Quaturn* which will interest you and which we are anxious to tell you. A postcard to any of our offices will bring them.

The WALLACEBURG BRASS & IRON MANUFACTURING COMPANY, Limited

WALLACEBURG, ONT.

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Winnipeg: Moncrieff & Endress, Ltd., Galt Bldg.

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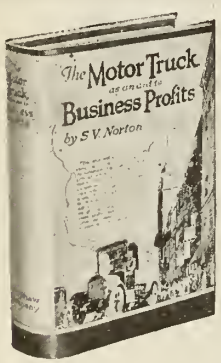

A Veritable Encyclopedia of Motor Truck Facts, Figures, Methods and Systems

Here is a book that considers practically every phase of successful motor truck operation. It was written by S. V. Norton of the B. F. Goodrich Company, after a country-wide investigation into the possibilities of the motor truck.

It describes the many ways in which the motor truck is being used to win business, give better service and build profits. It gives a description of practical, low-cost delivery systems—tells how to lengthen the life of the motor truck—what to look out for—how to map out a complete routing system—how to figure upkeep costs—how to keep your truck going at minimum expense—in short, here is a book that will tell you anything you want to know about successful motor truck operation, that will enable you to get 100 per cent. service from its use.

Almost every method described in The Motor Truck as an Aid to Business Profits is accompanied by an illustration, a chart or a diagram. You read the description, then with a glance at the illustration you see instantly how it works and how you can apply it. If you are a motor truck owner this book will save and make money for you. If you are a prospective user it will tell you "Yes" or "No" whether the purchase of a truck is a good investment.

A Small Investment But Big Returns

A single suggestion from the pages of this book may add five years of life to your truck. One new idea may result in hundreds of dollars saved. A system of routing, a plan for keeping cost records, for winning the co-operation of drivers—any one of these may result in increased profits that before would be impossible. Yet the price of this work is only $8.50. If it does no more than prevent a minor mishap, this much at least has been saved. But it will do far more than this—actually place in your hands the plans, methods, systems and ideas of thousands of successful motor truck users. You profit from their experience—you avoid the mistakes they made—you learn where and how they saved money, cut expenses and increased earnings. 530 pages—228 photographs—4 inserts—112 sketches—forms, diagrams, charts, tables and blue-prints—all yours for cutting delivery costs and increasing your profits.

Part I—Fitting the Motor Truck Into Your Business
Chapter I—The Field of the Motor Truck in Modern Business
Chapter II—When to Change From Horse to Motor Delivery
Chapter III—Comparing Cost of Horse and Truck Delivery
Chapter IV—How to Determine Cost of Performance
Chapter V—How to Keep an Effective Record of Costs
Chapter VI—Selecting the Right Truck for Your Work
Part II—Making Your Motor Truck Do More and Better Work
Chapter VII—Planning the Delivery System Right
Chapter VIII—Devices That Reduce Loading Time
Chapter IX—Effective Scheduling and Routing
Chapter X—Carrying More Goods With Special Bodies
Chapter XI—Principles Governing the Use of Trailers
Chapter XII—Using Trailers to Haul More Goods
Chapter XIII—Helping the Truck to Unload Effectively
Chapter XIV—How to Get Your Driver's Co-operation
Chapter XV—Supervising Your Truck by Mechanical Devices
Chapter XVI—Installing a Bonus System
Part III—Maintenance That Lowers the Cost of Upkeep
Chapter XVII—What Underlies Sound Motor Truck Maintenance
Chapter XVIII—How One Man Solved the Maintenance Problem
Chapter XIX—Saving Money Through Proper Lubrication
Chapter XX—Why Overloading Means Bigger Repair Bills
Chapter XXI—How to Curb Overspeeding and Other Abuses
Chapter XXII—How Tires Can Raise or Lower the Cost of Upkeep
Chapter XXIII—Selecting the Right Tires
Chapter XXIV—Solving the Garage Problem
PART IV—Building New Business With Your Motor Truck
Chapter XXV—Using Motor Trucks to Increase Profits
Chapter XXVI—How the Motor Truck Can Help You Meet Competition
Chapter XXVII—Using Motor Highways to Reach Distant Markets
Chapter XXVIII—Making Your Motor Truck Advertise Your Business
Chapter XXIX—Increasing Profits by Cutting Delivery Costs
Part V—Present Tasks and Future Problems
Chapter XXX—How Motor Truck Associations Hedp Truck Owners
Chapter XXXI—How to Meet Unreasonable Legislation
Chapter XXXII—Problems of the Future

The MacLean Publishing Company, Ltd.,
143-153 University Ave.,
Toronto, Canada.

Please send me a copy of Mr. Norton's book "The Motor Truck as an Aid to Business Profits," all packing, postage and duty charges prepaid. My cheque for $8.50 is enclosed.

Name .....
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Pipe Fittings

Made in Canada

The Brand that has the Quality

M Brand Pipe Fittings, etc., give a service and satisfaction that will invariably get you re-orders and much new business as well.

A trial of the goods will prove this claim.

CAST IRON FITTINGS

With this brand mean fittings made with iron of high tensile strength—proper proportions and correct tappings.

RECESSED DRAINAGE FITTINGS

MALLEABLE FITTINGS

With this brand mean fittings made of Air Furnace Refined Iron, reamed and tapped to gauge with perfect threads.

Standard and Extra Heavy Flanged Fittings and Flanges. Galvanizing . Malleable and Gray Iron Castings of all Kinds.

International Malleable Iron Co., Limited, Guelph, Ontario, Canada

Why Jenkins Bros'. Valves Are Superior

Fig. 106

They are the original renewable Disc Valves. They have more imitators than all other makes of valves combined. They have kept pace with increasing steam pressures and severe working conditions. They are of the simplest design, and can be easily repaired by any man of ordinary intelligence. They are made interchangeable in every part, and any part can be duplicated promptly and inexpensively by the dealer. In the majority of cases they can be repaired by merely changing the disc without the laborious task of regrinding.

Fig. 108

Fig. 114

They are recognized as the Standard Steam Valves in all parts of the World, and wherever there are supply houses—Jenkins Bros'. Valves will be found. The Standard of quality never changes except to improve, and while to-day there are hundreds of imitators, the sales of genuine Jenkins Bros'. Valves are constantly increasing.

Catalogue No. 8 sent free on request.

Fig. 124

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Montreal, Canada

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LIMITED
Agencies in all the Principal Countries of the World

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Kingsway, London, W.C. 2
England

"The Mysterious German Onions"

On nights when the German air raiders were out, they sent up strange, luminous balls behind their lines and anchored them above the clouds—globes of fire which could be seen for forty miles or more. What these "onions" were, or how they were kept in stationary position above the clouds, is still a profound mystery. The Allies never learned anything about them, but the Allied night bombing crews steered their course to the Rhineland by the luminous buoys thus provided.

What is known about the onions is told by Lieut. J. Vernon McKenzie in the course of an article, "Raiding the Rhineland," in MARCH MACLEAN'S. It is an intensely interesting article, telling all about the great reprisal campaign which implanted the fear of war in the German civilian heart.

"NO HOPE FOR THE WETS"

"Already the temperance forces are lined up to stop any possible break in the prohibition dam," writes J. K. Munro, in discussing what is going to happen at the coming session at Ottawa. He predicts that Union Government will hold together, but that the habit it has contracted of promising everything asked is going to make a lively session. He expects:

Dry legislation at the earliest possible moment.
The moral reform forces in control.
No change in the Divorce Law.
Tariff concessions made to the West.

The March number, in fact, is full of live, up-to-the-minute features.
The famous Canadian Ace, Lieut.-Colonel W. A. Bishop is on the cover.

Some of the outstanding articles and stories are:

The Transformation (a new serial)—By Frederic S. Isham.
A Canadian King-maker (the story of Lord Beaverbrook in Britain)—By Maurice Woods.
Fitting in the Returned Soldier—By George Pearson.
The Three Sapphires—By W. A. Fraser.
The Strange Adventure of the Nile Green Roadster—By Arthur Stringer.
Fakers—and Others—By E. Ward Smith.
Lend Me Your Title—By Onoto Watanna.
A Shady Deal—By Archie P. McKishnie.
The City of Lost Laughter—By Mary Josephine Benson.

The Voice of Canada Interpreted

A new department starts in this number given over to summarizing and presenting opinion in Canada on outstanding topics, as reflected in the press. In this issue the department is given over to a careful compilation of opinion on the problems of the returned soldier.

Events of the World in the Remaking

Germany Ready for Trade War
Three-Year Marriages in France
No Solution in Ireland Possible?
Controlling Booze in Britain
Is Czar Still Alive?
Did Dr. Diesel Die?
The Secret British Ferry
The Poison That Didn't
The Problem
The German Spy in Holland
The Mysterious Sinn Fein Leader
Why Harrison Fought Lloyd George
Hun Spies Outwitted
Will Trotzky Hire Huns?
The Achievements of Allenby

Over 65,000 Canadian Families Buy

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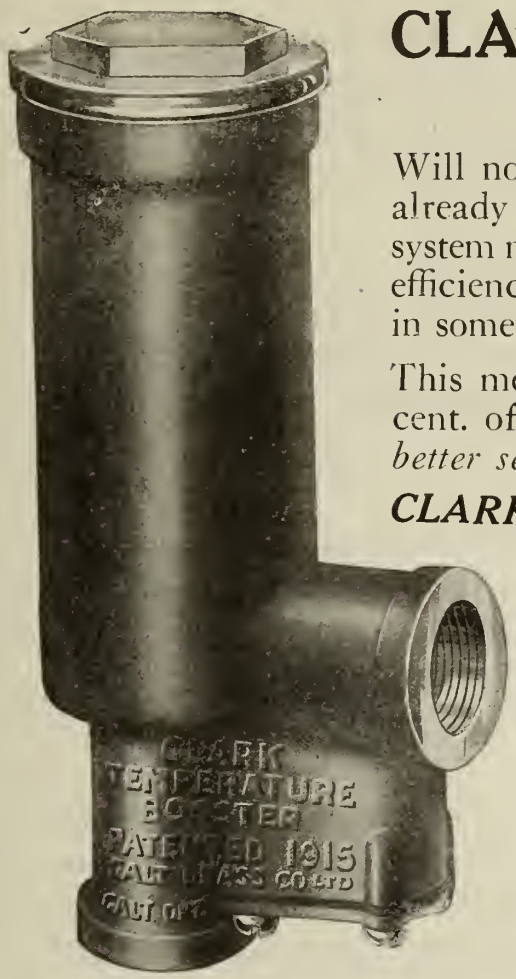

CLARK TEMPERATURE BOOSTERS

Will not only improve a hot water system already in service, no matter how well the system may work. But it will create a higher efficiency to the extent of 15 per cent., and in some cases more.

This means that in a good system 15 per cent. of fuel can be saved and still *have a better service.*

CLARK TEMPERATURE BOOSTERS

Will save pipe and fittings when installing a new job. Because it increases circulation. It increases the temperature in the water, and therefore a less volume of water at a higher temperature is necessary to give off a given amount of heat units.

Here's Some Real Information

Suppose a certain building required 1,000 square feet of hot water radiation to heat it to 70 degrees Fahrenheit when the outside temperature stood at 10 degrees below zero. Basing the radiation on a water temperature of 212 degrees, a Clark Temperature Booster would raise that volume of water 15 per cent. higher, thus only needing 850 square feet of radiation for the same building. Figure that out and you will find we can save you money all along the line.

Write your jobber or write us. It's all the same to you or us.

GALT BRASS CO., LIMITED

GALT, CANADA

CATALOGUES FOR THE PLUMBERS

Some months ago we issued our Booklet showing Plumbers' Enamelware for the home, and many of the leading jobbers in Canada were good enough to say that it is a most useful and convenient catalogue.

It shows the popular and leading lines of Baths, Lavatories, Sinks and Laundry Combinations, and is just the right size to put in your pocket when you are visiting your customer for the purpose of interesting him in a new Bath Room.

The fixtures are beautifully illustrated and attractively trimmed with modern and up-to-date brass or nickel-plated fittings. Prices are quoted in plain figures, and are such that the Contractor or Sanitary Engineer can make a fair profit on his sale.

The policy of the Company is to distribute through the recognized jobber as a convenience to the Sanitary Engineer. This enables us to keep a good stock at all the principal points of distribution, and enables the Contractor to obtain "PORT HOPE" Enamelware at the minimum cost.

By the way, we will have our Booklet "Enamelware for Public Buildings and the Factory" from the Printers early in March. A copy will be mailed to you. If you don't get it before the 15th, write us. It's well worth having.

Port Hope Sanitary Mfg. Company, Limited

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PORT HOPE, ONTARIO

Head Office:
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TORONTO SHOWROOMS
119 King St. East

WINNIPEG OFFICE
405 Tribune Bldg.

MONTREAL SHOWROOMS
234 Beaver Hall Hill

HALIFAX OFFICE: McCurdy Building, Hollis Street.

SANITARY ENGINEER

VOL. XIII. MARCH 1, 1919 No. 5

Help Along the Housing Scheme

The Trade Can Do Much—Men Should Be Encouraged to Buy Their Own Home and Vacate a Rented Home—Each Would Then Be Vitally Interested to Keep Down Cost—Workmen Owning Homes Help to Stabilize Industries

By One of Us

IT WOULD be safe to say that of all the problems, one of the most important ones to solve in Canada is the housing question. There are so many angles from which to view it and so much depends first and last upon the providing of homes for our returned men, as well as for natural expansion of our population, that it would, we believe, be a good thing if each workman would be made to see all the benefits to himself that would accrue if he would take advantage of the offers which the Governments, Federal and Provincial, are putting forward.

There are thousands of journeymen sanitary and heating engineers who need homes of their own. There are thousands who, no doubt, will be looking for a job unless this housing scheme is boosted along. The last Victory Loan was over-subscribed for the purpose of keeping industries going, manufacturers of all lines were told to expect lots of export orders, and so on. But the manufacturers of sanitary and heating goods in Canada are not naturally exporters. Canada has been importing vast amounts of plumbing and heating goods, and frankly we do not see how our particular manufacturers can all at once begin to expect export trade. Therefore it would appear that the best way out would be to boost along the various housing schemes. The Government is financing the projects, and the trade can take work on. Workers are becoming more numerous, and therefore will be ready to execute work to advantage this summer, so that houses in large quantities will be available for occupancy before the winter is upon us.

Now, one way by which this scheme can be boosted would be for every employer to take this matter up with his employees, discuss the question, and see how many houses could be built for employees. These men could even arrange to work in the very houses in which they hoped to live, and this would be an incentive to them to do the work well and do it quickly, so as to cut down the cost as much as possible. It may be argued that as tenders would first have to be furnished, the cost of a given house would be based upon the tenders for the various kinds of work contracted for, and that prices in that case would be fixed.

Here is, however, another side to the question. Suppose, for example, that John Brown & Co. procures a contract for plumbing to be installed in twenty-five houses, and he has Tom Jones, plumber, working for him. Tom is going to buy one of the twenty-five houses and has made his choice. Mr. Brown says to Tom, "Now, boy, my tender for these houses amounted, for plumbing, to $300. If you can cut on the cost allowed I'll meet you in sharing with you a substantial amount of the money saved." And suppose that Tom can see himself getting a 10 per cent., or even a 5 per cent. reduction, does it not stand to reason that he is going to put some pep into that job? Why of course it does.

And the same arguments could be used all along the line in every trade. There is need of some real educational work in connection with this scheme. Speculators want to be told that no non-producers will be allowed to participate in this housing scheme, that land must be expropriated or procured at prices which will not permit inflated profits being paid. In fact, the sooner people learn that land speculating of all kinds must cease, the better it will be for all. The cost of building lots must have a great bearing upon the class of house built, and if the standard lot suggested by the housing branch of the Commission of Conservation is to be, in towns, 1,800 square feet, and in rural districts 4,800 square feet, then without doubt the cost of city lots must come down.

In conclusion, it seems to the writer that it is the duty of every sanitary and heating engineer employing a number of workmen, one or more, to give this question some deep thought and discuss it with these men from every angle. Every applicant for a home is no doubt making a job for himself. Let's all get behind this scheme and help it along.

TRAVELLERS AND HEALTH

During the past few months the members of the branches of the Order of United Commercial Travellers in Saskatchewan have been very active in endeavoring to bring about a better condition of things in the way of hotel accommodation. For a long time complaints have been very bitter in regard to this matter, and after a number of discussions in different parts of the province it was definitely decided to bring the condition of hotels and boarding houses, especially in the country places, to the notice of the Provincial Government. This has now been done, with the result that Premier Martin has interested himself in the question and has promised that reforms shall be instituted at any early date. Any changes that will be made will be purely for the protection of the travelling public and those persons who are compelled to use public eating places. The members of the Moose Jaw branch have seriously complained at the lack of comfort and even of cleanliness that has been experienced, and in some cases they have brought to light a state of affairs that showed that a grave menace to public health has existed.

The lines upon which reforms are promised can be found in the provisions of a bill which was introduced into the Legislature in Ohio, on January 21, 1919. Travelling men who have examined its provisions say it covers every point, and is an ideal piece of legislation for its purpose.

The Bill further provides that every hotel or restaurant shall have proper plumbing, lighting and ventilation, which shall conform to the building code. All lavatories, bathtubs, sinks, drains and urinals shall be properly constructed and shall be kept clean and well ventilated at all times.

It would be a mighty good thing if travellers in sanitary and heating goods would themselves take a little more interest in these matters and suggest improvements, by taking up the matter of insanitary conditions with the local sanitary engineer, pointing out how sales can be made and jobs secured.

Dobson Stages a "Come Back"

A Moses Irons Salesman Takes a Hard Fall—But Learns That a Bump in Time May "Save the Bacon"

(Reprinted by kind courtesy of "System, the Magazine of Business")

By DANIEL LOUIS HANSON
Illustrations by George Brehm

THERE was gloom in the front office; gloom on both sides of the flat-topped desk. Gloom enshrouded Moses Irons, and gloom enshrouded John Renwick. The countenances of the two men, between them, couldn't raise a ghost of a smile.

But it was John Renwick who felt the first impulse towards action. "We will discharge Dobson!" he exclaimed vindictively.

"Why?" was Moses Irons' simple inquiry.

John Renwick looked at his chief in amazement: "Hasn't he lost the Hydeville High School contract for $13,000?"

"No; for $13,303.09. Will you never learn exactness, John! But in Minneapolis two years ago he lost a $50,000 order and still stayed on. You never even whispered to me that he should be cashiered."

"That was a cast iron pipe order; only price talked then. To have mentioned quality would have made the very streets laugh. And the loss of that didn't hinder our going up and scooping the next big order the following year.

"But this Hydeville deal was more than an order; it was a precedental proposition; nail that and we were good for the rest of Hydeville schools till the end of time. Quality was the 'open sesame' on this proposition—and we surely had the quality stuff, didn't we?"

Moses Irons acknowledged that they had. "I see—now out, out for all time. This was the Mayflower order of Hydeville from which all subsequent orders would spring and have standing. I don't like it, John, but to fire Dobson for this —"

"But Dobson has been going down hill for some time," broke in Renwick. "I still insist that there is such a thing as periodicity in the business lives of men. Dobson is 38 and the brain wrinkles have been hardening for two or three years. He is less susceptible to outside impressions and slower on making up his judgment of men and things. He has gotten so that he can't see the other man's viewpoint, therefore he can't plan a sales campaign effectively. Osler was right in his diagnosis, but extreme in his remedy, of course. I—"

Here Moses Irons broke in: "As a diagnostician you are an artistic success, John! Another sentence or two and I would have been paying Dobson a year's salary as premium if he would quit at once. What Dobson needs isn't a post-mortem, but a tonic. He lost that high school job, but I don't intend that there is going to be any precedent about it! He's in the second trench only—and that means nearer the front than the rear.

"Byshee, telegraph Dobson to go back to Hydeville and wait for me. Then look up my trains and make a reservation for to-night."

The Dobson who awaited Moses Irons in the Grand at Hydeville the next morning was well-gotten up, hardly looking

Renwick attempted to speak, but Moses Irons had the floor: "Hardening of the brain wrinkles is no imaginary ill, but the brains of a sales organization are supposed to center in its manager"

his 38 years. His address was impressive, his good fellowship was written all over his face. In short, he was the sort of man whom men like to be seen with. Yet he had lost that initial order of $13,000 to the Vento Company—a concern which turned out school fixtures that were a menace to the health of any community. Again and again during the last three years the Vento fixtures had been ripped out of schools in the largest cities and Moses Irons'—or others of equal standard—were installed.

It was generally believed that the Vento Company was on its last legs, yet here it delivered a knock-out blow to the best advertised goods on the market.

II

"Just what was the matter?" asked Moses Irons after Elmer Dobson had finished a detailed statement of the fight. "Were you to blame, or were we in Chicago at fault? Hadn't we worked up the field properly with our advertising campaign—sort of barraged it for you? Or are you getting so that you take things easier—don't work so hard?"

"As I stated, it was a case of 'buy'—" began Dobson. Moses Irons made a gesture which suggested a housewife brushing down cobwebs: "You are too quick in making that charge, Dobson! There is much less trickery of that type in public work of this kind than either you or John Renwick seems to be willing to believe.

"Granting, however, that there was crookedness, that's the easiest of all competition to face. I would rather have competitors who are crooked—looking at it from the 'get the order' standpoint—that to be faced with a chap who is on the square.

"Tell me the viewpoint of the schoolboard—just what they said to you after handing out the order to the Vento Company."

It appeared that the schoolboard, through its chairman—a physician at that!—had talked learnedly with Dobson about the superior merits of the Vento fixtures, where a current of air was the disinfectant rather than water as with most modern and generally approved plumbing fixtures. . . .

"Repeated the Vento Company's dope throughout, eh?" exclaimed Moses Irons. "I see that our advertising is off somewhere. I'll tell Renwick the moment I'm back in Chicago! When that old stuff about air versus water, as the medium for sewer disposal, gets in under the skull of a physician, we need a new advertising manager.

"But where were you all this time?" he demanded of Elmer Dobson after he had diagnosed the failure to land the order.

The explanation the salesman made cleared the situation to Moses Irons. "You have grown to depend so on your advertising department having the field ready for you that you were surprised; Blucher didn't arrive and night was too far off, so you were Napoleon at Waterloo." With this rather mixed recollection of what happened 100 years earlier, the ironmaster set out to retrieve the ill fortune which had fallen upon his establishment in Hydeville a few days before.

"You used the arguments about typhoid being spread by unsanitary plumbing fixtures, I suppose?"

"Yes; the water supply of Hydeville is above suspicion, so whatever disease of the kind exists is due to bad plumbing."

"And how much exists?" asked Moses Irons.

This question Dobson couldn't answer; he had talked generally instead of specifically.

"You didn't localize," said Moses Irons, leaning back in his chair. "You have talked about bum plumbing propagating and spreading typhoid—you failed to tell how and where it spread that disease right here in Hydeville.

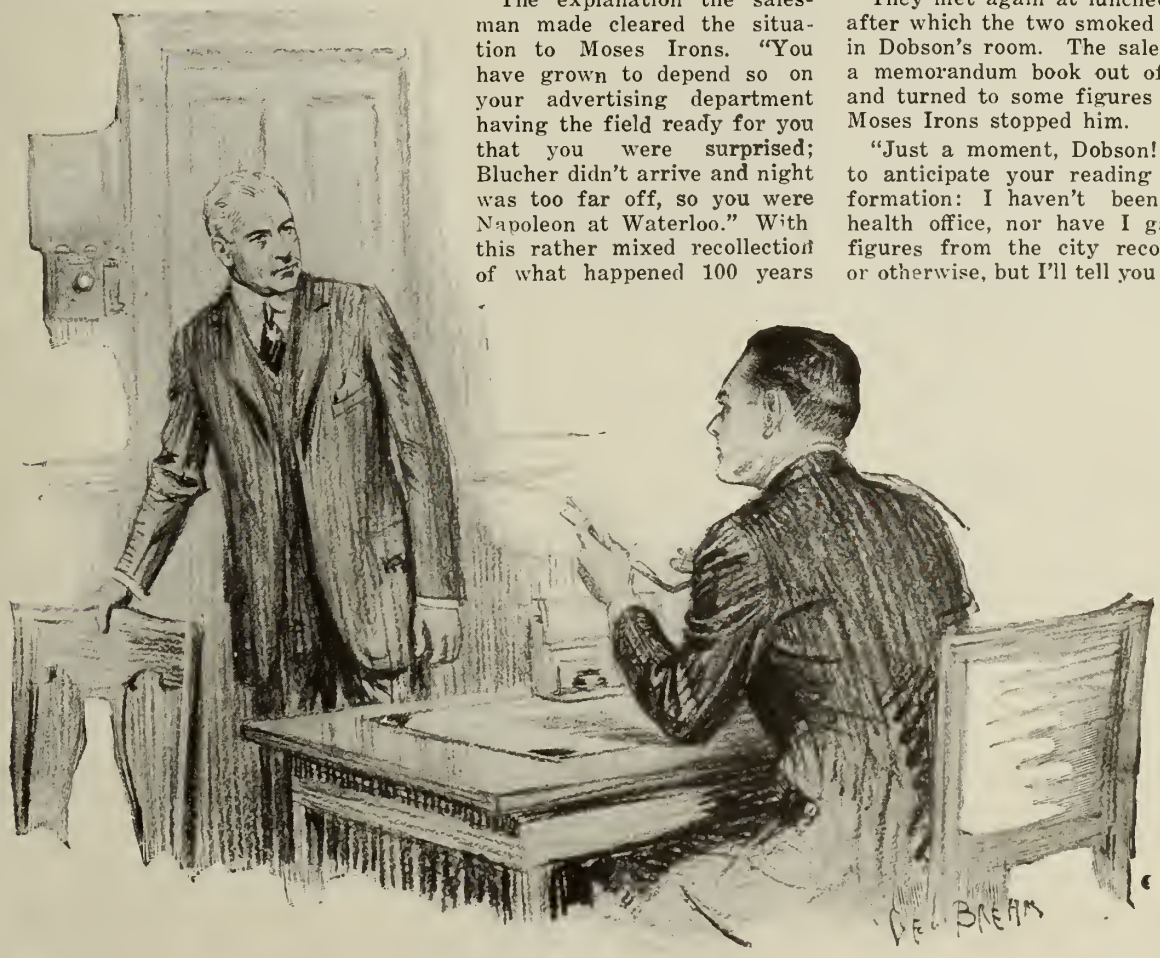
"Did you interview the local health officer? . . . I thought not!"

"It would seem that they, and especially the physician on the board, would have been quick to draw the local parallel," Dobson argued.

"That was your business to do, sir! Now let's get busy and obtain the sick records for each ward of the city during the last two years as they govern typhoid—and typhus, if there has been any. I'll look around town and get a general view of the situation."

They met again at luncheon that day, after which the two smoked their cigars in Dobson's room. The salesman pulled a memorandum book out of his pocket and turned to some figures therein, but Moses Irons stopped him.

"Just a moment, Dobson! I'm going to anticipate your reading of that information: I haven't been near the health office, nor have I gathered any figures from the city records directly or otherwise, but I'll tell you what I have



The salesman pulled a book out of his pockets and turned to some figures, but Moses Irons stopped him. "Just a moment, Dobson! I'm going to anticipate your reading of that information"

learned by keeping my eyes open.

"There is more typhoid in the Third Ward than there is anywhere else in Hydeville, isn't there?"

"Yes, sir."

"Next comes the Fifth Ward, then the Fourth, while the First and Second are comparatively free from it."

"You have called the turn, Mr. Irons, but how?" asked Dobson.

"By looking over the plumbing of the various school houses; the Third Ward school has the vilest type of 'fresh air' fixture. Therefore I reasoned that typhoid would prevail there more than in the other wards, where conditions are not so bad. The Fifth has the 'fresh-air' system in only one of its two schools, while the Fourth has only a few fixtures of that type in use.

"The First and Second Wards have nothing to boast about, but their sanitary equipment is the water-scouring type of one make or another and causes their localities to be comparatively free from filth diseases.

"Now, my boy, you have your task laid out for you; they are just laying the high school foundations. It will be over six months before anything but the bare walls will rise—by then you not only can get back into the first line trenches, but you can go over the top and bring in that high school order."

"But how?" demanded the confused Dobson.

"By working matters so that the school board will be compelled to install new plumbing fixtures in the Third Ward School."

"But that hasn't even been talked of!" protested Dobson.

"That's where you will have the inside, Dobson. The Third Ward School must be equipped with Moses Irons' school fixtures during this vacation period. You will have three months; it isn't a large school and the installation will be quite easy. Then with Moses Irons' fixtures in the Third Ward, don't imagine for a moment that the people of Hydeville will consent to having the filthy Vento system in their $100,000 high school building."

"But the people haven't anything to say in the matter." Evidently Dobson's faith in the power of a free people had been considerably shaken.

"Don't deceive yourself, Dobson! Salesmanship as applied by us supply houses to public institutions consists, in its highest exemplification, in selling to the public and not to a few officials invested with a brief authority. That's where you missed your cue before. Get after the public this time."

And Moses Irons drew his chair alongside of the table and began to talk to his salesman in the low voice which always indicated that he was down to brass tacks.

III

John Renwick was gone that August when the order for the Hydeville Third Ward School fixtures came in, and so much work was piled up on his return that the complete shipping slip went through later without his noticing it in a particular way. So it was late November before the subject of Hydeville again came up.

One morning Renwick was delayed by a hot box on his train and didn't reach the office until nearly noon. In the meantime Moses Irons had gone through the orders and sent those marked rush to the shipping office. So it was a fairly clean desk at which Renwick sat down. There was a note from Mr. Irons, however, on the calendar pad:

"Lunch with me at one—please—Kingsley's."

They had finished the Lucullian banquet from which Moses Irons never varied whenever Renwick was his guest—planked whitefish with plenty of watercress, hard rolls, a side dish of celery, and tea: "Whitefish doesn't overheat your brain, John; and the afternoon is when your brain tends to overwork," Moses Irons had said, as on every former occasion of the kind.

And now they settled back for what the Ironmaster had up his sleeve. Renwick couldn't even guess its nature.

"We never had any talk about that Hydeville affair, John; you had to leave the city the morning I came back from there and you were gone in August when the order for the Third Ward School went through. But you remember that you wanted to fire Dobson for falling down on the deal?"

"Yes, and I still think I was right. There wasn't any excuse for our losing that order."

Evidently the whitefish and tea had left Renwick with a clear brain.

Moses Irons nodded: "I agree with you, John. Someone should certainly be fired for losing such an order!

"I found that Dobson had gone out there and passed around some platitudes about 'fresh air' fixtures being detrimental to the health of a community—not that particular community, but any old place. And at that, with some irrefutable data at his command which would have won him the deal, he nevertheless let the Vento Company walk away with the $13,000 plum."

"Hardening of the brain wrinkles, self-sufficiency, and lack of ability to see the other fellow's viewpoint," was Renwick's comment. "Nothing is gained by keeping such a man on the payroll." He added this last because he thought he saw symptoms of finally swinging Moses Irons his way.

"It looked as if you were right," yielded Moses Irons, and Renwick didn't notice the use of the past tense. "Well, I did my best to show him where he had been at fault; and I made it clear to him that you would not be satisfied with anything short of either his resignation or the complete order for the high school fixtures!"

"The order for which was already placed with the Vento Company," commented John Renwick.

"The order for which the Vento Company already had," agreed Moses Irons. "Naturally Dobson felt the matter keenly, as he should; but he got to work at once to get back into the first line trenches—and over the top.

"First he dug out statistics which showed that the Third Ward, which had the 'fresh-air' system in it entirely, also had the highest rate of typhoid; that other wards with only partial systems of that type had lower rates, while those with even the crudest water-scouring closets were practically free from the plague.

"He then dug out from the Third Ward a young, zealous, and ambitious physician—the last quality, ambitious, not having much scope in the Third Ward. With this man he became closely acquainted, laid before him the relative health figures, and, I think, took him to an adjoining town or two to point his argument, until the young physician was convinced that health and plumbing were hitched up together; also that the workingmen's ward, as the Third was termed, was getting it in the neck."

"What did this cost Dobson?" asked Renwick.

"Nothing except those rides to nearby towns, there is more public spirit among folks than a few crabs will ever understand—" Moses Irons said this in his smoothest tones.

"Then, having gotten a signed statement from the physician, Dobson took it to both the daily papers. The Bugle, a moss-grown party sheet, refused to print it; the Free Lance, the less prosperous and more awake, took it under consideration and after an investigation, during which Dobson was particular that the young, zealous, and ambitious physician got well acquainted with the young zealous, and ambitious editor, gave the stuff publicity through its editorial columns.

"Dobson had some photographs taken of that Third Ward School, which in due time appeared in the Free Lance, for the editor wasn't satisfied with one blast any more than Dobson and the physician were; he went back to the subject again and again."

"And what did all this cost?" again asked Renwick, who wasn't quite sure by this time whether the conclusion of the conversation would be especially to his liking.

"The price of those rides to nearby towns—possibly $10—plus the price of photographs—possibly $5. We can go over the expense account later, John. Then, the Free Lance having established pretty well in the minds of the public that 'fresh-air' plumbing fixtures weren't sanitary, Dobson had inserted in both the Free Lance and the Bugle advertisements of Moses Irons' Sanitary Plumbing Fixtures for Schools—"

"I never saw the copy!" sputtered Renwick.

"But the public of Hydeville did. And the public of Hydeville insisted that new fixtures be installed in the Third Ward School instanter. The school board, in the face of the Free Lance revelations of what the 'fresh-air' system had done, couldn't very well buy Vento Fixtures, for Dobson's advertisements, while not attacking the Vento Company, had clearly pointed out that the principle of using anything but water as a cleansing agent was vile.

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VOL. XIII. MARCH 1, 1919 No. 5

LICENSES AND EXAMINATIONS

THERE is a feeling abroad that men in the plumbing and heating trade need no more to be licensed than should a bridge worker, a bricklayer or a painter. That the work of a plumber and steamfitter is only just a little bit removed from a laborer, etc. Many architects and speculative builders and bulk contractors hold such opinions, and, in fact, some of the two last-named classes of fellows are not a little peeved to think that they cannot procure an unlicensed man now to do their work on a percentage basis, etc., the bulk contractor getting the material, etc., as "wholesale."

Well, now—it may be all very well from their side of the fence to hold such opinions. But there are other sides to the question. In the first place, it does require skill and lots of it to install plumbing and heating. It requires years of training and then not all has been learned that there is to learn of the science of plumbing and heating.

And, again, when a householder calls in a man to make some repairs to a defective or leaking pipe or trap, he requires a skilled man. When an architect submits plans for tenders on heating or plumbing, or both, the chances are that a skilled man will have to go over the "layout" very carefully and in most cases re-design the whole system.

Expansion and contraction has to be understood and provided for, free flow of wastes must be planned, the elimination of obstructive turns and bends and provisions to clean out piping at various convenient locations — a thousand and one problems have to be worked out, all requiring skill. Now, what objections can there be to rules and regulations that are put into force and enforced, if such are necessary to safeguard the public's interest in the final analysis?

Take heating, for instance. If men were required to pass an examination and be licensed before they were allowed to install furnaces, thousands upon thousands of tons of coal and other fuels would be saved, and hundreds of lives that have been lost would not have been lost. During the winter months scarcely a week passes that one does not read of someone losing his life as a result of defective furnace installations.

So that when we consider that the work of sanitary and heating engineers involves the lives and health of our citizens, it is only just, right and fair that some jurisdiction be enforced to prevent impractical men from engaging in such important work. They are custodians of the lives of those persons for whom they labor.

LICENSES REFUSED TO AMERICANS

TO the average reader it would, on the face of the matter, appear rather strange to be told that an American plumber cannot get a license to work at his trade in Toronto. But according to the Toronto *Star*, Feb. 13, such is the case:

"A morning paper statement that American business people 'would be expressly exempted if the anti-alien by-law were adopted in Toronto,' is not being well received by American business men here, who point out that the Toronto Police Commission a few weeks ago passed a regulation which prohibits Americans in this city from engaging in businesses which require a license. The fact is that Americans are to-day being refused licenses at the City Hall and it is understood that the United States Consul has protested in vain. An American cannot get a plumber's license or a restaurant license or a laundry license, or any other license under the Police Commissioner's jurisdiction. The new regulation says that these can be granted only to British subjects or native-born Canadians. And all others are being refused. Chinamen, of course, are being refused renewal of their laundry licenses.

"So far as can be learned, however, friendly aliens who were in business here prior to 1919 are not closing down in the meantime, as they understand that the Board of Control and Police Commission will get together and see whether a distinction cannot be made between friendly and enemy aliens. A peculiar feature of the situation is that many aliens got licenses for the year before the commissioners made its adverse ruling and a license, once granted, cannot be revoked.

"To get a license to-day, an applicant who has been naturalized must be able to produce his papers."

Such a state of affairs is likely to have a very important bearing upon the plumbing trade—from several angles.

In the last issue of SANITARY ENGINEER there appeared an article which dealt with the apprentice question. It showed that up to the present time very few Canadians are learning the plumbing trade, at least not in a sufficient number to keep up the demand for plumbers or sanitary heating engineers. The article stated that most of the full-fledged journeymen came from England and Scotland.

There was some hope of getting a few from the United States, but, with the alien law being put into

force, that avenue for a supply of journeymen will be closed. However, there is another reason, too, in Toronto why licenses would not be freely granted to applicants. An applicant for a license to work at the trade is required to pass an examination. He has to go before an examining board, and answer questions, oral and otherwise, and he must show that board that he has had sufficient practical experience to enable him to execute certain work in a proper and skilful manner. This procedure must be carried out no matter where the applicant was born—Canada or anywhere else.

Thus it will be seen that it is very necessary for the trade to encourage young men to enter the profession and become apprentices, as well as that employers should pay more attention to the apprenticeship problem.

In next issue the first part of a bulletin appears, which explains what is being done in Wisconsin, U.S.A., regarding the apprenticeship problem, and we would recommend every earnest reader of SANITARY ENGINEER—employer, manufacturer and journeyman—to devote some little thought to this question. It is only by so doing that the Canadian trade can ever hope to solve the problem.

A HEALTHY COMPETITOR

WE have still a number of men in the trade, and in fact we find them in all trades, who are for ever in fear that their competitor may "Get Wise" regarding certain methods adopted in a shop, which methods are proving a success.

In another part of this issue will be found an article on the use of motor trucks. One member uses a truck to do repair work and adopts a method of carrying all the necessary tools and repair parts, pipe fittings, etc. Another drives his men to and from a job, gets a list of material required for a job, and takes it out at the same time as inspecting the work. Still another buys a motor cycle and a side car with tool box attached and so on, and all are more or less making a success of their enterprising move.

But why all this secrecy? The chances are the other fellow has gone into the question of cost in the first place before taking the jump, and the cost has looked out of all proportion to the service.

However, here is the question. Time is money, and money makes the mare go—even to the extent of making the mare shift out to make place for a motor truck.

The point is that there are no secrets on this earth, except possibly in Germany. Let them stay there, and let us get down to business and realize that to have successful competitors who adopt sound business principles is far more to be desired than irresponsible men, who merely guess success and lose out in the end.

Of course, we must admit that there are certain limits beyond which a person should not go when enlightening his competitor. But, as a rule, showing all the cards proves best in the long run. It is the men who fail in business, and are not strong enough to meet every adverse move, whom we have most to fear—not the successful competitor.

He Wouldn't Advertise

HE started in to run a store like lots of folks have done, he reckoned he could go ahead and make the business hum. He got a corner site, he did, he daubed it up with paint to make the place he picked upon look somewhat like it aint.

And then he went and bought his stock, 'twas new and likewise crisp, he reckoned that this outfit would keep them coming brisk.

He stuck a sign upon his door, another on the wall, they were artistic things, by heck, like yeller leaves in fall.

He got a rig to peddle with, he had that painted too, all fussed and frilled about his name in colors red and blue.

He figured folks would see that name at either aft or for an dtrade would come a-crowdin' then unto his plumbing store.

The paper man dropped in one day, he ran a goodly sheet, he told the plumber man how he could put him on his feet—but this here gent he chucked him out, in business he was wise, he wasn't tossin' up his coin, he wouldn't advertise.

If other folks was usin' space that was their own affair, he'd build his trade upon his goods, and prices what were square.

But somehow folks they didn't fall for all his painted signs, nor yet for all his painted rigs, and stuff up with the times. They 'llowed as how his store was nice, his goods were all right too, but they didn't know just when he had some fodder that was new. He didn't use the paper that they took into their homes, and so some other plumber was pullin' in the bones.

He reckoned that the trade would come by waitin' round a spell, but while he waited half his goods got old enough to smell. But still he didn't use no space to tell the folks in town how he could 'tend unto their wants and trim the prices down.

Well, things they went along like this, they went from bad to worse, and 'bout the only thing to do was holler for the hearse. Until one day he quit the store, the trade was far too tame, and the chap that has the business now—the bailiff in his name.—ARK.

The Value of the Motor Truck

Information Furnished by Our Readers Shows That Motor Trucks Are of Great Value to the Trade—Not Yet Fully Taken Up—Time and Money Saved—More Work Done—Men on Jobs Get Material Quicker

MANY men in the plumbing and steamfitting trades are asking themselves at the present time: "Is a motor truck a real saving in my business?" With the view of being able to answer the question, SANITARY ENGINEER sent out several hundred letters to its readers, asking if they use motor trucks; if so, how many, and what make? Whether they use solid rubber tires; how long they have used their trucks; what the carrying capacity is, and whether they use them in their jobbing and repairing work?

Of 79 replies received to date of February 24th, it was found that 42 of this number use either a truck or a car in their business of a capacity of ½ to 1 ton.

The ½-ton truck costs in the neighborhood of $300 per year for upkeep. A firm in Stratford runs two ½-ton trucks at a cost of $200 per year apiece. These trucks are used in both town and country. In the West the truck costs more. Running expenses are $1.50 per day, which would amount to about $450 per annum; these figures are cited by a firm in Regina, while another Saskatchewan company calculate on from 6 to 7 cents per mile, which amounts to about the same figure. The former firm use their cars both in city and country work, and have found them so satisfactory that they are preparing to add another to their number at no very distant date. The latter firm use their car almost exclusively on jobbing and repair work, and feel they could not be without it. The one-ton truck seems almost as popular as its smaller brother, several larger firms having one or more of these. The one-ton truck costs about $400.00 per year in upkeep—which includes "gas"—as against the ½-ton truck of $300.00 per year. A firm in Grimsby does 8,500 miles per year and reckons their expense at 4 cents per mile. They have been using a truck for 5 years. Each year they trade in their car and get a new one, paying the difference between the value of a new and old one and thus cutting down their repair bill very greatly. This system is in general favor among the most successful owners. "Cheaper by far than a horse and wagon," is almost the general verdict.

A Dunnville firm use a ¾-ton truck and for four years have found that for repairs only such a truck costs about $100 per annum.

A St. Catharines firm using a ¾-ton truck states that, while they have not any figures available, they have estimated that their truck cost 40 per cent. more than a horse and wagon, but at the same time 75 per cent. more work can be done.

In Toronto one firm of plumbers and steamfitters have used a 1-ton truck for a period of 10 years, and estimate the cost at $4.00 per week, while another Toronto firm use a touring car to take their men to and from work and for their foreman on his tours of inspection. A firm from Amherst writes that before they got their ¾-ton truck 2 years ago, they used to pay $400.00 per year for hauling. This is what the truck has cost them, but their hauling has increased.

A Kamloops, B.C., concern use a car to take their men to and from work. They have had their car for a year and so far it has cost them $200 for oil and gas.

The opinion of the vast majority of car owners is that the truck saves a great deal of time over the horse, that it is more reliable, and, in most cases, less expensive.

Now, the question most important these days is: Are members of the trade using cars or trucks to the extent that they really should? For example, as a result of interviewing personally a number of plumbers and steamfitters who do not use such appliances, cartage accounts ranging from $150.00 to $750.00 per year were shown us. Not only so, but there are without doubt certain losses in time of men waiting at jobs for material. Such losses are beyond the control of those having to pay for the cartage hire. So that there are many items of loss not apparent, and not fully realized until a truck or car is actually acquired.

Then again there is the time saved by the proprietor of the business, streetcar fares, time saved walking, etc. All means a saving in cold dollars and cents, and when one realizes that a ½-ton truck or small runabout can be procured, and paid for out and out, in a matter of 3 years, in actual time saved, it is no wonder that almost 50 per cent. of the replies received from our inquiries state that the writers are users of trucks or cars, or both.

This is an age when time is about the most valuable commodity. Cost of labor is high, money must be turned over quick, and more work must, therefore, be squeezed into a day. The car or truck has a tendency, too, to speed up all interested, and it is ready at a moment's notice.

In the next issue of SANITARY ENGINEER we will show our readers how some of the trade use trucks as well as cars. We will also show how the truck or car service charges should be made out. The replies we received did not give any real data as to how certain costs were arrived at. So that in our next article we will endeavor to give more particulars, etc.

USES OF ZINC IN THE BUILDING TRADES

With the spread, among builders, of the knowledge that zinc is made remarkably ductile and tough by rolling, that metal is steadily displacing the more expensive lead and copper for roofing, flashing, spouting and guttering. In many situations galvanized iron, commonly used for outside work, is cheaper in first cost, but when length of life, cost of painting and replacement are taken into account, it is more expensive for permanent construction. Rolled zinc is now largely used in the manufacture of the so-called "leaded" glass. This zinc is often giben the lead finish desired for architectural effect. Zinc is also made into the forms of shingles and tiles, which can be treated to give highly artistic effects. These possess the great advantages of durability and unbreakability. Spouting and guttering of zinc also have artistic possibilities. Zinc may be hard, medium hard and soft rolled. The hard rolled will not stand bending for seam work, while the soft metal can be drawn, bent and spun into the greatest variety of shapes. Prejudice against the use of zinc has its root in ignorance of these various qualities. No one using brass sheets would order it without specifying the kind of brass, yet ordinary sheet zinc is expected, when bought from a dealer, to meet any and every use. In spite of popular belief to the contrary, zinc is one of the metals most easily soldered.—"Chemical and Metallurgical Engineering."

WATERPROOFING CEMENT

All outside cement work should be waterproofed. Cement is porous, and absorbs water, with the result that the concrete is continually being disintegrated and weakened by the water and by the frosts. The waterproofing of cement structures has been carefully investigated by engineers, who have found that the most effective method is to impregnate the concrete with oil, whereby the absorption of water is prevented. The application of gasoline, in which from 5 to 10 per cent. of paraffin wax has been dissolved, is recommended. The fluid can be applied to a concrete surface by a brush, or sprayed over it with a hand-pump.—"Coal Age."

PROPER HEATING OF BUILDINGS PROMOTES HEALTH

By J. E. McCormick

I HAVE just received from a nerve specialist in New York a booklet entitled "The Prevention of Colds, Influenza, Grippe, Pneumonia, and Tuberculosis." Incidentally, the author thereof passes a few remarks on the subject of "Heating" and of "Humidity." I have been wondering whether or not some of his remarks might not be of sufficient economic importance to be worthy of consideration by engineers in charge of heating plants. I have never given much attention to the heating and ventilation of buildings. My chief concern along such lines has been to prevent long lines of pipe from bursting during temporary shutdowns in cold weather, therefore I am not competent to judge of the above matter, neither am I at present in a position to give it a proper try-out. I shall quote from the booklet chiefly such parts as might concern engineers in heating plants. In some instances the booklet contains several paragraphs between the parts I have selected. I quote:—

"(a) When a fluid or moisture evaporates, a chill is produced. As an example: Moisten your finger and blow against it, you will observe that the side you blow against will feel cold."

"(b) The degree of chill produced through evaporation depends directly upon the rapidity of evaporation. The more rapid the evaporation, the greater the chill."

"(c) The rapidity of evaporation depends mainly upon the degree of dryness of the air coming in contact with the fluid or moisture. Free air always contains a varying amount of moisture. The less moisture it contains the more readily it will absorb moisture, and vice versa."

"From the foregoing it should not be deduced that moist air always feels warmer to the body than dry air. This applies only when the temperature is above 60 degrees or thereabouts. At lower temperatures the reverse is the case, that is, cold moist air feels colder than cold dry air, for the same reason that cold water feels colder to the skin than air at the same temperature."

"Perhaps the most common cause of colds is the disregard for the degree of humidity in heating and ventilating our living rooms."

"As an example of the influence of low humidity, I shall cite a condition that existed at the U. S. capitol at Washington, D.C., during the winter of 1913-1914. In the hall of the House of Representatives there was a mysterious "chill." Frequent complaints were made and many illnesses resulted. The engineers forced the temperature up to 77 degrees, but still the chill remained. In the Senate hall, on the other side of the building, there was perfect comfort with a temperature of 68 degrees. Finally, after a thorough investigation, it was found that the chill in the House chamber had been due to low humidity. Tests showed that the humidity at times dropped to 20 per cent. In the Senate chamber it was nearly 40 per cent."

"Not one room in a thousand is properly humidified. It is only in our large public buildings that the state of humidity is given any attention."

"The question arises: 'What is the proper humidity for a living room?' It is agreed that from 50 per cent. to 60 per cent. is not too high. High humidity combined with high temperature is extremely depressing, but if the temperature is kept below 70 degrees, the humidity may be 70 per cent. or even 80 per cent. without causing discomfort."

"For the bodily comfort, therefore, it is necessary that our rooms be kept reasonably moist. Since we feel far more comfortable in a room heated to 65 degrees and with a humidity of 50 per cent., than in a room heated to 75 degrees and with low humidity, we could save at least 33 1-3 per cent. in heating expenses by keeping the air in our homes and buildings moist."

"To humidify a room of average size it requires that about a quart of water be evaporated daily. This produces a humidity of about 50 to 60 per cent."

"Health lies in the mean, and not in the extreme. This applies especially to heat, cold and humidity. It should be our aim to keep the body comfortably warm, cool, moist and dry, which means a humidity of about 50 per cent. and a temperature of about 64 degrees. Of course, it is impossible to meet these conditions at all times, but we can at least endeavor to do so."

The "saving in heating expenses" paragraph took my eye. It must be remembered, however, that the maintaining of a few extra degrees of heat throughout a building in New York City means a greater proportional expense than would the same few degrees in a similar building located in our colder Canadian climate. Nevertheless, if any such saving can be made in that place an appreciable saving might perhaps be obtained in Canada by the same means.

The author of the booklet mentions methods of humidifying air. Among other things he says: "There is sold in most house furnishing stores a special tank, which may be suspended from the back of the radiator. The heat from the radiator evaporates the water in the tank and thus moistens the air." The question in my mind is: If thermo hydroscopes, or else hygroscopes, were installed in addition to thermometers and means were provided whereby the engineer could control both the humidity and the temperature, would this result in an appreciable lowering of the heating expense and at the same time provide a more healthy atmosphere for the residents to live in? Will someone who has studied heating and ventilation and has been in charge of house heating plants, please give us his experiences on this subject?

What is Heat? Heat is a form of energy. By touching a body we can tell whether it is warmer or colder than the hand and by touching two such bodies in quick succession we can form a rough opinion as to their difference in hotness or coldness over a limited range, the colder body, if of the same material and of the same size, will contain less heat than the hot body or less energy is stored up in it in the form of heat. From physical reasoning it is possible to conceive of a body which has no heat at all and this body will have a temperature of absolute zero. This point has never been reached by experimental methods but has been approached to within a few degrees.

What is Cold? Cold is merely the absence of heat and in the usual sense it is used in comparing one body with a hotter one.

How is Heat Measured? By means of a thermometer which measures the temperature of the body and by means of its specific heat or the amount of heat which it contains. The amount of heat in a body depends upon its temperature and upon the material of which it is composed as well as upon its mass. Some materials require a greater amount of heat to raise them through one degree of temperature than others, for instance water requires about eight times as much heat to raise it through one degree as cast iron for equal weights.

How Was the Thermometer Discovered? The thermometer was discovered by Galileo, who first developed a thermometer having a tube with a bulb at the top. The tube dipped into a colored liquid. Temperatures were indicated by the expansion or contraction of the air in the tube and bulb, which caused the liquid to be drawn up or forced out the tube. While sensitive this thermometer wasn't very satisfactory for it was subject to fluctuations according to barometric pressure. The more modern form of thermometer with a bulb, a sealed tube and a contained liquid is also attributed to Galileo, about 1612.

Alcohol was the first liquid used and the graduations employed on the Fahrenheit thermometer were proposed by Gabriel Daniel Fahrenheit in 1714. He proposed to take as zero the lowest temperature obtainable by a mixture of ice and salt and to divide the space between this point and that of the temperature of the human body into 96 degrees. The fixed points were afterwards chosen at that of melting ice and that of boiling water at standard atmospheric pressure. This with the old divisions retained gave 32 deg. for melting ice and 212 deg. for boiling water.

For general scientific purposes the centigrade system is usually adopted. This has the zero freezing point marked zero, and the boiling point 100 deg., giving 100 degrees in between. The absolute zero spoken of above is 273 deg. Centigrade below the Centigrade zero.

How are the Fahrenheit and Centigrade Scales Converted from the One to the Other? Nine Fahrenheit degrees equal five centigrade degrees and this gives us a means of converting from one to the other. One other thing must be remembered and that is the difference in the marking of the freezing points, Centigrade, 0 deg., and Fahrenheit, 32 deg. To transform Centigrade to Fahrenheit then multiply by nine, divide by five and add 32 deg. To transform Fahrenheit to Centigrade, first subtract 32 deg., then mutiply by five and divide by nine.

If a Fahrenheit Thermometer Gives the Temperature of a Bearing as 62 deg., What Temperature would a Centigrade Thermometer Read? Subtract 32 deg., multiply by five and divide by nine. The result will be 17 deg. (nearly).

What is Meant by a British Thermal Unit (B.T.U.)? A British Thermal Unit is the amount required to raise the temperature of one pound of water through one degree Fahrenheit from a temperature of 60 deg. Fah. The temperature from which the water is to be raised is specified because the amount of heat necessary to raise the water through one degree varies slightly with different temperatures. What is it a measure of? It is a measure of the quantity of heat.

How Many B.T.U.'S are there in a Pound of Good Coal? Good coal runs from 13,000 up to 14,500 B.T.U. per lb. These figures are of course only approximate and coal varies greatly in its calorific value.

What is the Mechanical Equivalent of Heat? The mechanical equivalent of heat is the number of foot-pounds of mechanical energy equivalent to one British Thermal Unit. The most probable value is 778 foot-pounds to one B.T.U.

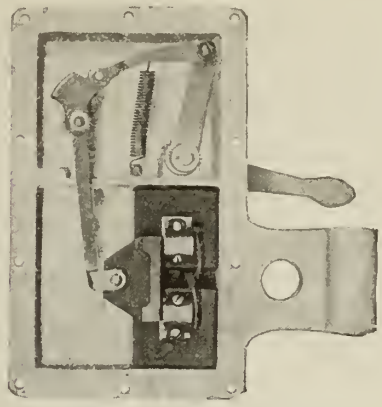
If all the Heat in One Pound of Coal Could be Turned into Horsepower, How Many Horsepower Hours Would be Produced? One heat unit or one B.T.U. equals 778 ft. lbs. Assuming a value of 14,000 B.T.U. for one pound of coal the number of foot lbs. of work stored in it will be $14{,}000 \times 778$. One horsepower hour equals $33{,}000 \times 60$ foot lbs. Therefore the number of horsepower hours will be $14{,}000 \times 778 \div 33{,}000 \div 60 =$ 5.4 h.p. hours.

VISITING CANADIAN CITIES

R. J. Dulaney, general manager of Canadian Desolvo Co. and Chamberlain Co., Pittsburgh, has been calling upon a number of members in the trade in a number of Canadian cities. He reports that the outlook is very encouraging for the sanitary plumbing trade.

ENCLOSED TANK SWITCH

THIS enclosed tank switch is of the single-pole double-break type, is instantaneous in action and suitable for use in tanks, etc., where regulation of liquid level between high and low limits is required. The construction avoids opening of the switch before the proper time and is free from the sticking and burning of blades that make trouble with a knife switch. No part of the casing or mechanism can become charged.

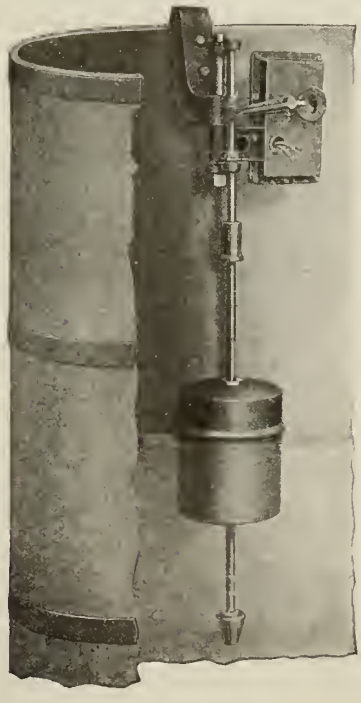


INTERIOR VIEW OF SWITCH.

The regulation is obtained by a float operating the switch, which in turn actuates a solenoid controlling mechanical or other electrical devices.

The case consists of a cast iron body and cover with corresponding flanged edges that permit the use of a gasket for damp proofing. The gasket makes it as nearly waterproof as any switch for its purpose can be. A substantial lug at one side of the back provides a means for standing to a supporting post.

The internal electrical and mechanical parts are separated by an inside dividing partition which forms two separate compartments. A block of transite ebony asbestos bolted into the electrical compartment of the case supports the fixed contacts and also acts as an insulating bushing for the incoming wires, which are brought through a boss in the back of the case. This boss is threaded to receive a ¾ in. conduit.



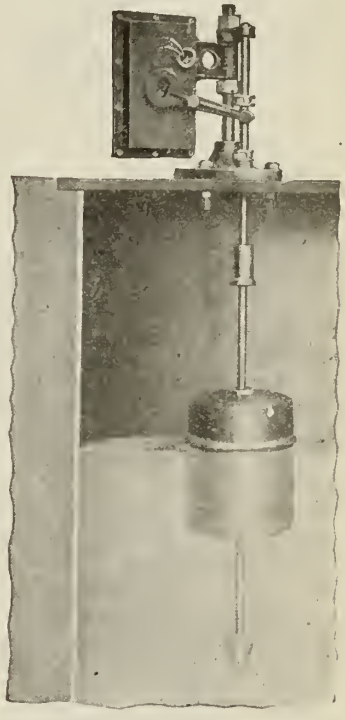
INSTALLATION IN TANK.

The fixed contacts are short cylinders of carbon held by set screws in machined brass terminals bolted to and insulated by the transite block.

The bolts which hold terminals and transite block together are countersunk and sealed at the back, and the wires are held by flanged binding screws on the sides of the terminal blocks.

The moving contact is a folded copper strip bolted to a piece of transite, which is loosely pivoted in the forked end of the cam lever. A flat spring within this fork keeps the contact piece always in correct position.

A float riding up and down on a guide rod hits a limiting stop on the rod. As it does so, the rod is carried up or down, and through collars upon its upper end



imparts a corresponding movement to the switch lever. The length of travel of this lever is limited by a stop acting in a slot on the opposite side of the lever.

Movement of the lever oscillates a shaft and "grasshopper" lever, which in turn move a roller across a cam on the end of the electrical contact lever. The roller is held closely to the cam by a coil spring fastened to the dividing partition in the case. The tension of this spring throws the contact lever with a quick positive motion the instant the roller passes over the centre of the cam.

All internal levers are made of cast brass and are of substantial size and strength.

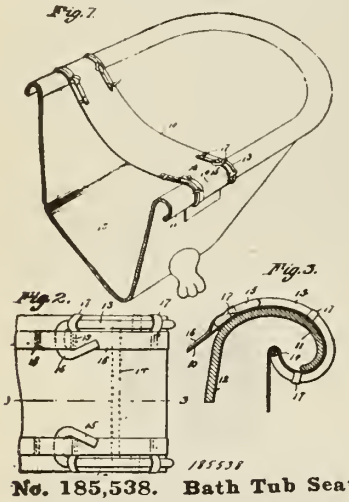
This device is manufactured by the Blackburn Smith Corporation.

New Canadian Patents

No. 185,538

Rudolph Stroll, Washington, District of Columbia, U.S.A., 16th July, 1918; 6 years. Filed 30th May, 1918. Receipt No. 295,555.

Claim.—A bath tub seat comprising a flexible band and suspension means on the ends thereof, said means comprising



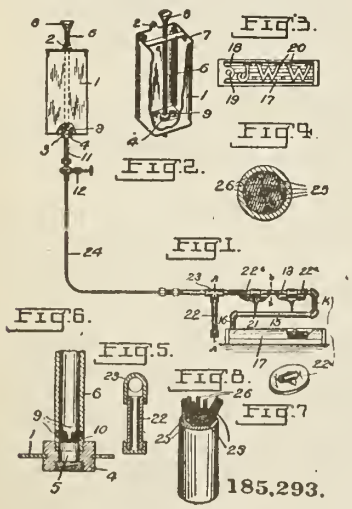
No. 185,538. Bath Tub Seat.

laterally spaced shanks curved in the direction of their length to fit over the rim of the tub, hooks projecting from the inner ends of the shanks, keeper strips on the band into which the hoops are insertible, and retaining strip on the band beneath which the shanks seat and are longitudinally slidable when the hooks are disengaged from their keeper strips.

No. 185,293

James William Walker, Montreal, Quebec, Canada, 2nd July, 1918; 6 years. Filed 5th February, 1918. Receipt No. 290,602.

Claim.—In a gas generating and heating apparatus, the combination with



Gas Generating and Heating Apparatus.

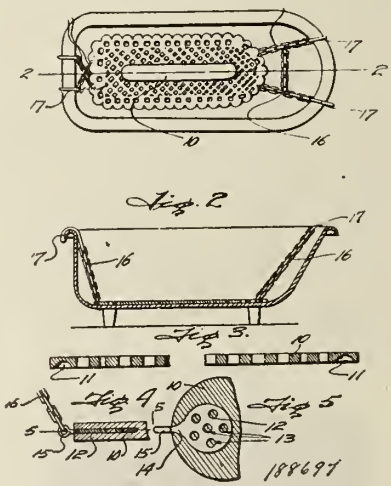
fuel supply means, of a gas generating chamber in communication therewith, comprising a pair of connected horizontal pipes disposed one above the other in parallel relation, the lower pipe having a plurality of burner openings, and a filling of intermingled strands of mineral absorbent material and wires within said pipes, said absorbent material serving as a wick to cause even feeding of the fuel and vapor to said openings and also serving to prevent the inner walls of said pipes from peeling.

No. 188,697.

Luvinia D. Tolley, Algiers, Louisiana, U.S.A., 11th February, 1919; 6 years. Filed 10th September, 1918. Receipt No. 299,200.

Claim.—1. The herein described safety bath mat comprising a section of flexible waterproof material, plates embedded in the ends of said section of material, chains secured to said plates, and hooks on the ends of said chains.

2. The herein described safety bath



No. 188,697. Bath Mat.

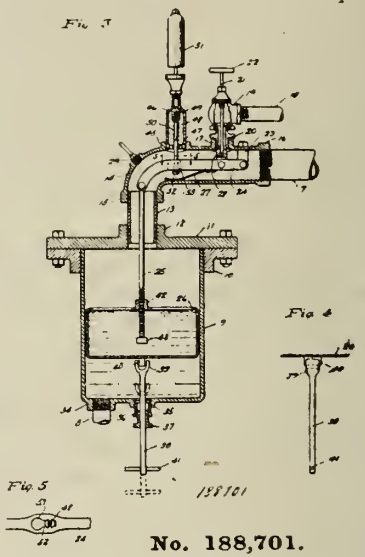
mat comprising a section of flexible waterproof material, plates embedded in said section of material near the edges thereof, said plates being provided with perforations which are filled with the material of which the mat is formed, chains secured to said plates, and hooks on the ends of said chains, which hooks are adapted to engage the upper portion of the bath tub to which the mat is applied.

Claims allowed, 2.

No. 188,701.

Walter L. Foster, Whittier, California, U.S.A., 11th February, 1919; 6 years. Filed 9th October, 1918. Receipt No. 300,253.

Claim.—1. A regulator for pumps comprising an equalizing chamber having a steam connection and a water connection, said steam connection comprising a pipe having a port in the wall thereof communicating with a steam pump, a valve controlling said port, a lever for operating said valve detachably mounted in said pipe, a spring secured to said lever and tending to hold said valve closed, and a bucket float in said equaliz-



No. 188,701.

Boiler Feed Mechanism.

ing chamber connected to said lever and tending to open said valve.

4. In a boiler feed control, an equalizing chamber having a bucket therein, a connecting rod upon which said bucket is adjustably mounted, and an adjusting rod extending through the equalizing chamber and disposed to be engaged at will with the bucket to adjust its position on the rod.

7. In a boiler feed control, an equalizing chamber, a connecting rod therein having a threaded end, a bucket secured on the threaded end of said rod, said bucket being provided with a lug, an adjusting rod extending through the equalizing chamber so as to be rotated and moved axially, said rod being provided with fingers to engage said lug.

Claims allowed, 7.

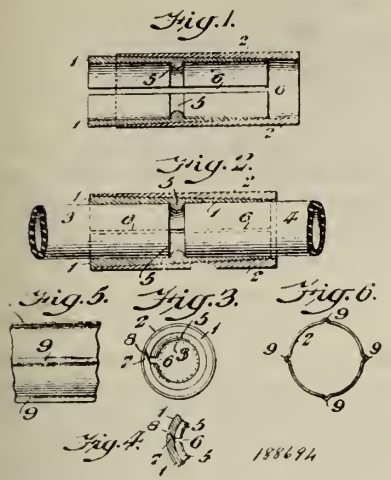
No. 188,694.

Joseph Geary Tallman, Philadelphia, U.S.A., 11th February, 1919; 6 years. Filed 25th November, 1918. Receipt No. 301,886.

Claim.—1. A coupling of the character stated formed of an inner thimble having its interior surface of cylindrical form and its exterior surface of tapering form, and an outer thimble having its interior surface of tapering form to fit the exterior surface of the inner thimble, an inwardly projecting nurl on the interior surface of the inner thimble, said interior thimble being divided through its length, said nurl being also divided through its length in register with the division of said thimble.

2. A coupling of the character stated formed of an inner thimble having its interior surface of cylindrical form and

its exterior surface of tapering form, and an outer thimble having its interior surface of tapering form to fit the exterior surface of the inner thimble, an



188,694. Pipe Coupling.

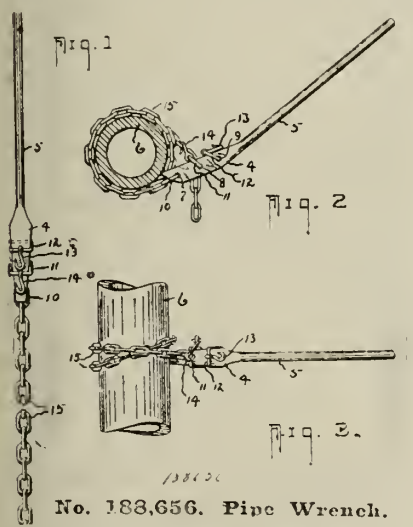
inwardly projecting nurl on the interior surface of the inner thimble, said interior thimble being divided through its length, said nurl being also divided through its length in register with the division of said thimble, the opposite terminals of the walls of the division of the inner thimble being formed respectively with an overlapping tongue and a bevel face for the latter.

Claims allowed, 2.

No. 188,685.

Frederick H. Scott, Louisville, Kentucky, U.S.A., 11th February, 1919; 6 years. Filed 16th September, 1918. Receipt No. 299,377.

Claim.—1. A tool of the character described, comprising a two-part ring



No. 188,656. Pipe Wrench.

member having its parts hinged to each other, a catch carried by one part and detachably engageable with the other part to hold the ring closed, a socket extension formed on one part, a gripping jaw slidable in the socket extension, an adjusting screw threaded in the socket extension and swivelled in the jaw, a pair of gripping jaw members detachably engaged in the inner periphery of the ring in spaced relation to each other, a two-part ring rotatably connected with the first-named ring at one side thereof and having its parts hinged to each other, rotatable cutters carried in the second-named ring and protruding beyond the inner periphery thereof, and means on one part of the ring and active on one of the cutters to adjust the same.

2. A pipe tool comprising a pair of coaxial two-part ring members, each having means for holding its members in ring relation, a pair of movable cutting elements carried by one of the ring members, a pair of movable clamping jaws carried by the other ring member, thread cutter element adjustably mounted in the first member, the adjustable mounting including a screw constituting a handle for that ring member, a clamping jaw having an adjustable mounting in the second ring member, its adjustable mounting including a screw constituting a handle for the second member, the ring members being connected for co-axial rotation with respect to each other.

Claims allowed, 2.

DAWSON STAGES A "COME BACK"

Continued from page 16

"Then with the advertisements of Moses Irons fixtures running in the Hydeville press, the idea had somehow gotten out—you know how the public is!—that they were the only fixtures for that Third Ward School.

"That order came in while you were dallying the summer days away at Coney Island—John—or was it Manchester-by-the Sea?

"Dobson was back in the first trench by then, you see. But you wouldn't be satisfied, he knew, unless he went over the top."

"But that high school order was placed," said Renwick.

"Going over the top means you're after the enemy's positions, John. Isn't the 'fresh-air' system an enemy of public good health? The Third Ward school plumbing, not a big job—only 28 fixtures, was installed before school in September, and all Hydeville watched progress on that job. By then the high school walls were only half up.

"Then began the agitation: 'Why install the same thing in our new high school which has been found so insanitary in the Third Ward School?' Of course, the school board had to save its face, if it could, but public opinion is mighty powerful when it finally does get into motion. And though the Hydeville school board tried to buck it for several months, it had to yield at last."

Moses Irons, pulling some sheets of paper from his pocket, laid them in front of Renwick.

"There, John, is the order for Hydeville High School. Roughly, it amounts to $21,000."

"But the original order was for $13,000—"

"The school board had to save its face, as I said; they did so by adding more plumbing fixtures and a swimming pool. Dobson went over the top, John; and the impetus took him quite a ways into the enemy's lines!"

"But all that advertising cost some," objected Renwick.

"Yes, more than it would have cost had the sales department done its duty in the first place. Advertising, John, is the barrage with which an alert sales department prepares the battle field for its salesmen's advance over the top. To attempt a deal like that at Hydeville without such a preparatory barrage is sales suicide."

Renwick attempted to speak, but Moses Irons had the floor: "Hardening of the brain wrinkles is no imaginary ill, but it must not be forgotten that the brains of a sales organization are supposed to centre in its manager. Also this—the public is the ultimate buyer. An appeal to the public—if one has the goods, is pretty sure to be effective."

WILL BE TAKEN INTO PARTNERSHIP

Owing to the sudden death of the senior partner, Mr. W. R. J. Hughes, of the firm of J. W. Hughes & Son, Montreal, the business will be carried on as formerly by his partner, Mr. A. W. Hughes, who has been connected with the firm for over twenty years. Mr. W. U. Hughes, eldest son of the late Mr. W. R. J. Hughes, formerly connected with The Jas. Robertson Co., Limited, will be associated with A. W. Hughes in the business.

MONTREAL NEWS NOTES

P. Mercier, consulting engineer for the administrative commission of the city, is giving considerable attention these days to the new plumbing by-law. While considerable time is being taken to consider this, it is pointed out that the "last word" in an effective by-law is desired, and that no care will be spared to have the new Act cover every requirement. Comment is being invited from the various city master plumbers, for they will doubtless be in a position to express views that are practical and of an advanced nature.

Under Board of Health

The Plumbing Department of the City of Montreal is now under the direction of the Health Department. This change seemed to be a desirable one, the former arrangement placing this section under the care and direction of the Building Inspection Department.

Sanitary inspection is now being made under the direction of A. Cousineau, civil and sanitary engineer, and associated with Mr. Cousineau are P. Connolly and T. Paul. Mr. Cousineau has been giving a great deal of thought to the new by-laws and he has these well in hand, and reports that they will be available by the Administrative Commission for their approval in the near future.

P. J. Carroll, formerly with the Sewerage Department of the city, is now on the staff of the Plumbing Inspector's Department.

Teles Latourelle, president of the Montreal Master Plumbers was chosen a member of the hardware and metals committee of the Montreal Chamber of Commerce.

A Splendid and Worthy Ally

A Man Behind the Men Behind the Gun—Once a Plumber, Now Chief Executive in One of America's Largest Brass Plants—Became Designer of Airplane Flexible Gun Mount—The True Spirit of Co-operation Displayed

IF there is one man interested in the plumbing trade who never says "die" that man is L. A. Cornelius, president of the Canadian Wolverine Co., Chatham, Ontario, and Wolverine Company, Grand Rapids, Michigan.

Readers of SANITARY ENGINEER will recall the two disastrous fires which finally wiped out the Chatham plant soon after the war broke out. But in spite of those calamities, the trade was looked after just the same, and their wants supplied in such a manner as was appreciated.

But as soon as Uncle Sam took up the gauntlet thrown down by the Kaiser, every one of our American cousins joined in the fight with a will that shook every fibre in their bodies. It was a case of every big and little man volunteering his services in whatever capacity for which he was best fitted.

L. A. Cornelius was enjoying a well-earned and needed rest at Biloxi, Miss., and had decided to prolong his stay on April 5, 1917, when he learned that action by the United States Senate made immediate war with Germany inevitable.

On that very day Mr. Cornelius wired Senator William Alden Smith in Washington, offering his services gratis to the War Department as sanitary engineer, and this offer was formally acknowledged on April 17 in a personal letter from Secretary of War Baker.

Mr. Cornelius paid a visit to Washington and practically placed his company's plants at the disposal of the War Board. It was decided that he could serve best through production and development by the companies of which he was the head, and that he should give his attention to aircraft. Aircraft production, as an entirely new and undeveloped art, appealed to the inventive mind of Mr. Cornelius, as did also the fact that the airplane seemed to be the most effective weapon that could be developed; and after much hard work in rearranging the plants, Mr. Cornelius showed in concrete form that he and his whole staff, from the highest official to the humblest laborer, were ready to stand behind Uncle Sam to the very last. So great was the confidence of the War Board at Washington, that an order for 2,000 flexible gun mounts to equip airplanes was placed on Nov. 4, 1917, and by January, 1918, shipments of complete articles were made until the output of 60 complete mounts per day was reached by July of that year.

In the evolution of fighting equipment it was decided early in 1918 to use two machine guns on each mount, and in accordance with cabled instructions from General Pershing, certain changes were needed regarding movements, etc. It was to L. A. Cornelius that this work of designing was given, so great was the confidence that the production engineering dept. of the Bureau of Aircraft had in him, and results proved that this great responsibility was not misplaced. In fact, some of the most delicate parts of guns and gun mounts in connection with airplanes and aircraft generally was supplied by the Wolverine Company.

After numerous experiments and flying tests with various appliances, the company was also entrusted with the delicate task of making the so-called Venturi Pitot tube, which is a direct pressure and vacuum apparatus that is attached to the strut of the machine, and from which small air lines lead to the recording instrument, which is placed in front of the aviator. Mr. Cornelius made quite a number of airplane trips, and inspected many tests himself in actual working conditions. And, while we have tried to tell of some of the splendid work done by our friend Cornelius, we would be altogether remiss if we did not state that all these achievements were only made possible by the fact that every man and woman, from basement to top storey, were one with their chief "all the time, every time."

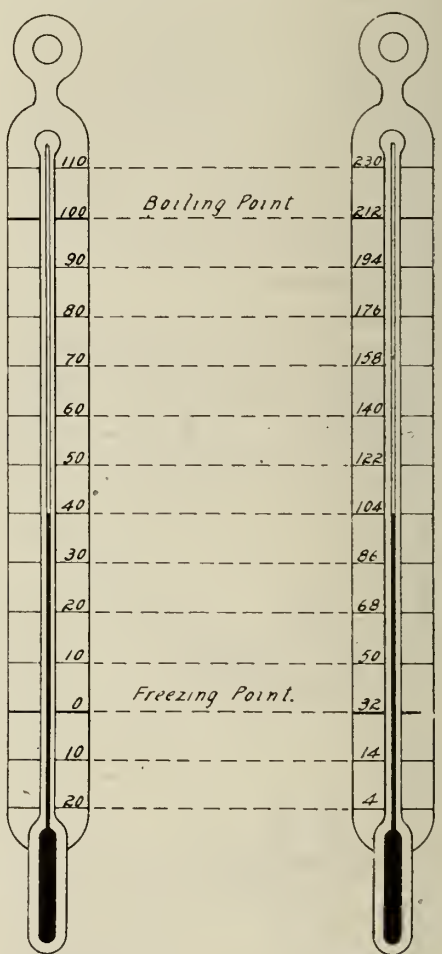
In this connection, the writer would like to relate a story which shows in real life the kind of men employed at this plant.

During a visit in Grand Rapids in the summer of 1917, the writer was strolling down one of the main streets and stopped for a moment to look at a very attractive war-time window display, which consisted of crossed flags of the Union Jack and Old Glory. He, the writer, happened to rub shoulders with an old gentleman, plainly, yet neatly, attired. Said he, "Isn't it grand to see those two good old flags so entwined?" or words to that effect. These remarks began a conversation, at the close of which the gentleman remarked: "Yes, I work for one of the best bosses and the best concerns in all America." That man was one of the boys behind L. A. Cornelius, the president of the Wolverine Brass Industries. That's the spirit that wins, the true spirit of co-operation and unelfishness, human to a degree. Such a spirit as displayed by that old employee is not bought with dollars, but rather acquired through confidence and square dealing. Gun designing, the ability to do things and get things done, money making and all other accomplishments sink into insignificance in comparison with the ability to deal square, to win the confidence of the little fellow under you.

THERMOMETER SCALES

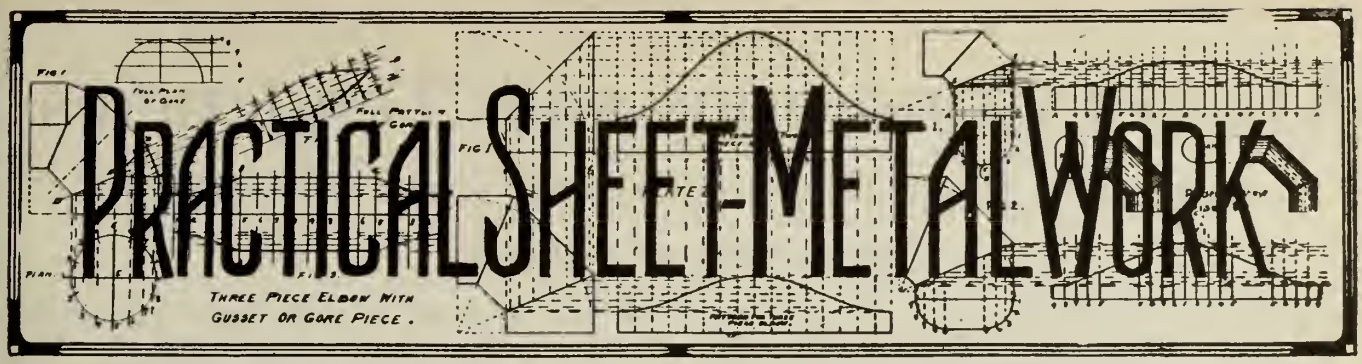
By T. L. Smith

When the term 40 degrees C. is used how does this correspond to the heat in Fahr.? The diagram shown in Fig. 1 answers this question graphically. To the right are shown the Fahr. temperatures, and to the left the corresponding



C. temperatures. From this picture it is evident that a temperature of 40 deg. C. corresponds to a temperature of 104 deg. Fahr.

The H. Mueller Mfg. Co., Sarnia, Ont., have in the course of preparation a 300-page catalogue on water, gas and steam brass plumbing goods. This catalogue is at present in the printer's hands and will be ready for distribution within a few weeks.



BY THOMAS STANSFIELD

IT has often been found that a chimney on a fairly good-looking residence has been too short and an extension piece has been required so as to improve the draft. And a round extension piece has not been quite as artistic as the owner would like, the following article shows what was done in such a case not long ago. The existing chimneys on the house were octagonal, and to make the extension look somewhat in keeping with the rest of the chimneys an octagonal one, with ornamental top, was made to fit the one described herewith; the cap piece will appear in the next article. Herewith is simply the taper piece from square to octagonal, the latter being the centre.

First draw the plane as shown in G H I K, and from I K Aa Bb Cc Dd draw a number of dotted lines, from which the elevation can be drawn. Now extend the dotted lines from centre line L horizontally, upon which the pattern must be developed for the large side; dotted lines Ee Dd must also be extended, cutting same as shown at N. Now place the compass at F in elevation and open to C; this measurement is transferred to N, cutting dotted line at O, and draw a vertical line through point O until points R P are developed. Now draw two more horizontal lines from H and K to R and P respectively.

By drawing solid lines, as shown from N^1 N^2 to R and P the pattern for the large side is complete.

To develop the pattern for the small piece draw centre dotted line L M through point K. Then draw two more lines from Cc Dd to S S, and, by placing compass point at F, opening them up to C, the true length of the small pattern is procured. By transferring this measurement to centre line L M, from short line S S to M, and by joining points S S and M, the pattern for the small piece is completed.

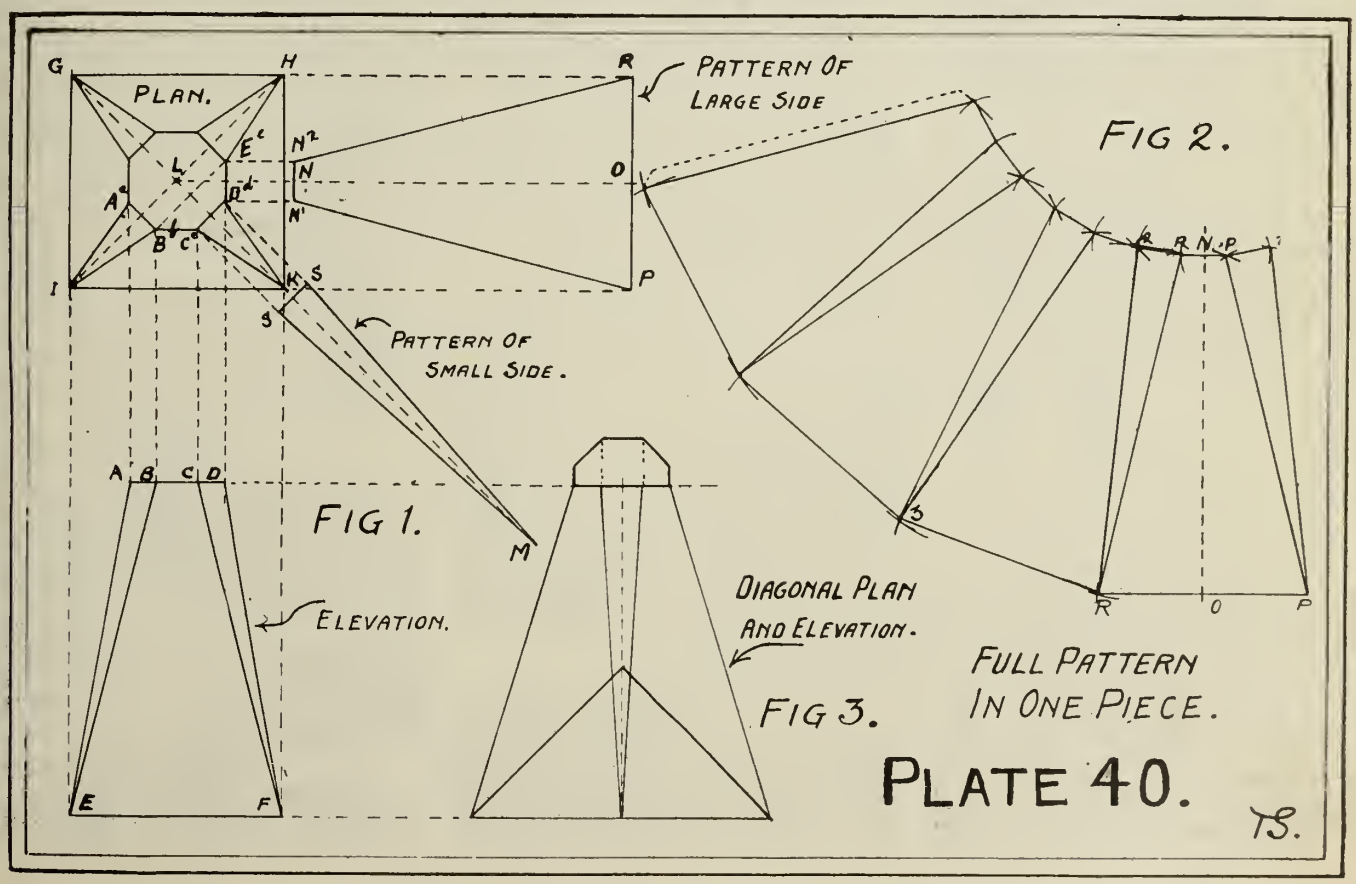
Now turn to the full one-piece pattern, Fig. 2, and first draw a vertical dotted line N O, repeating the instructions given when the pattern for the large piece was being developed.

Next place compass point at P, with P P as radius, draw arc 1, and by using P R at the top as radius, cut arc 1; by joining these points P 1 P the second portion of pattern is made.

Now place compass on lower point R, and with P at top as radius draw arc 2; then with R P at top as radius, cut the arc 2; drawing line from arc 2 to lower R completes the third piece.

The second large piece is now to be developed. With lower R and P as radius, draw arc 3, and again using the lower R and P at top as radius, draw

(Continued on page 32)



Market Conditions and Tendencies

Statements Regarding Supplies and Trend of Prices

THE MARKETS AT A GLANCE

PRICES of plates have been brought to a 5.50c per pound base. This is approaching the best that the warehouses can do. They are now in a position to get the lowest price at United States points, and as this material is put in with the war-price material it brings down the average. There is a feeling that this price will have to come down a shade yet before it reaches a stage where much trading will be done apart from material for actual consumption. There has been a slight recession in the price of black sheets as well, this being a general reduction in some quarters of 50c per 100 pounds. Galvanized sheets remain on an unchanged basis.

In line with information given out last issue, there has been a decline registered in boiler tubes. The present basis is 10 to 12 per cent. below figures previously ruling for warehouse shipments. Both mill and warehouse shipments now take the same basis, the price in favor of the mill business being overcome in the decline just named. Shipments of these are now coming along in good style, and warehouses are assembling a satisfactory stock.

Copper has broken badly at primary points, and quotations named locally are really only nominal to-day. Tin is rather inclined to be weak, with light stocks in evidence and trading small. Lead has declined since last issue and reacted again, and the market to-day is showing considerable strength.

Lead pipe and lead waste have declined 1c per pound, but no new quotations prevail on traps and bends or solder. Manufacturers are waiting to see if lead maintains its upward course. Firmer lead may equalize the weaker tin situation and result in a maintained basis of quoting for some little time on solder.

TORONTO, Feb. 26.—Declines have been recorded in steel plates and black sheets this week. Lower prices have also been named on boiler tubes and some lines of old materials have sagged still further. Tin is slightly easier, while lead, though quoted lower since last issue is on the upward trend again. Copper is very weak. Lead pipe and lead waste have declined.

Basis Same For Range Boilers

RANGE BOILERS.—The basis quoted on range boilers shows no change. There is little business being done just yet and the feeling prevails that a lower basis will have to be reached before much activity can be expected.

	Standard	Extra Heavy
30-gallon range boilers	$14.00	$17.00
35-gallon	17.00	20.50
40-gallon	20.50	24.00
52-gallon	28.00	32.00
66-gallon	37.00	42.00
82-gallon	45.00	50.00
100-gallon	62.00	70.00

Steadiness Shown in Enamelware Markets

ENAMELWARE.—The market rules with a steady tone at an unchanged basis of prices. This is usually a quiet time in this line and there is little trading being done. Quotations on a few of the standard lines are shown herewith:

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Basins, flat back, 14 x 15 in.	6 00
Do., corner, 15 in.	5 95
Sinks, roll rim, 18 x 30 in.	15 05
Closets, oak tank and seat	27 00
Do., enamel iron or white vitro tank	29 00

Soil Pipe; Fittings Show No Change

SOIL PIPE FITTINGS.—There have been no new developments in regard to prices ruling on soil pipe and fittings. The market is quite steady and business being done is within rather narrow limits. Cast, malleable and wrought pipe fittings show no further change from recent declines.

SOIL PIPE AND FITTINGS

Medium and extra heavy soil pipe, 2 in. to 6 in.	15%
Medium and extra heavy fittings, 2 in. to 6 in.	25%
8 in. soil pipe and fittings	Net list

C. I. PIPE FITTINGS

Cast iron fittings	12½%
Plugs	22%
Bushings	28%
Unions, standard	35%
Dart unions, ¼-inch to 2-inch	20%
Do., 2½-inch and larger	12%
Nipples, up to 4-inch	45%
Do., 4½-inch and larger	40%
Do., running thread 4-in. and under	25%
Couplings, 4-in. and under	35%
Do., 4½ in. and larger	15%

MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittings, Class A, lb.	0 53	0 66
Do., Class B, lb. net	0 24	0 33
Do., Class C, lb. net	0 16	0 24

Valves Ruling at Same Levels

VALVES.—An unchanged basis of quoting has been the situation during the past couple of weeks, and no immediate recession from present values is anticipated. Business is rather small just at present.

	Discount off list
Compression work, standard	45
High grade	41
Fuller work, standard	43
High grade	36
Basin cocks, No. 0 standard	38
Nos. 1 and 2	38
Bath cocks	48
Flatway stop and waste cock, standard	45
High Grade	45
Roundway stop and waste cocks, standard	45
High Grade	45
Brass steam cocks, standard, add 10%.	
Globe, angle and check valves, standard.	Net
Do., removable disc	Add 5%
Radiator valves, standard	10
Do., removable disc	Net List
Basin Cocks—	
No. 0 and 1, Fuller pattern	43
Globe, angle and check valves, standard, medium pressure	10
Radiator valves, standard med. pressure.	30
Radiator valves, removable seat, medium pressure	25

Cotton Waste Holds; Oakum Steady

WASTE, OAKUM.—There have been no new developments in the situation in regard to cotton waste or oakum. There is a fair amount of business being done and prices are maintained at levels mentioned in last issue.

	Per 100 lbs.
Best American	$21 00-$22 00
Clipper, spun	- 21 00
Do., unspun	- 10 50
Plumbers', spun	10 00- 10 50

Wrought Pipe Situation Steady

WROUGHT PIPE. — No material change has been noted in the situation

on pipe. Manufacturers report some inquiry which may well be expected to develop into orders and outlook is considered very bright for good business when season opens at an early date.

WROUGHT PIPE
Price List No. 38—January 6, 1919.

	Standard Buttweld			
	Steel		Gen. Wrot. Iron	
	Per 100 feet			
	Blk.	Gal.	Blk.	Gal.
⅛ in.	$6 00	$ 8 00	$	$ ....
¼ in.	4 68	6 81	5 28	7 41
⅜ in.	4 68	6 81	5 28	7 41
½ in.	6 21	7 78	7 06	8 63
¾ in.	7 82	9 95	8 97	11 10
1 in.	11 56	14 71	13 26	16 41
1¼ in.	15 64	19 90	17 94	22 20
1½ in.	18 70	23 76	21 45	26 54
2 in.	25 16	32 01	28 86	35 20
2½ in.	40 37	51 19	.....	.....
3 in.	52 79	66 94	.....	.....
3½ in.	67 16	84 18	.....	.....
4 in.	79 57	99 74	.....	.....

	Standard Lapweld			
	Steel		Gen. Wrot. Iron	
	Per 100 feet			
	Blk.	Gal.	Blk.	Gal.
2 in.	$28 86	$35 34	$32 56	$39 03
2½ in.	42 12	52 36	47 97	58 21
3 in.	55 08	68 47	62 73	76 12
3½ in.	69 00	86 94	78 20	96 14
4 in.	81 75	103 00	92 65	113 90
4½ in.	93 00	118 00	112 00	137 00
5 in.	108 00	137 00	130 00	159 00
6 in.	140 00	178 00	169 00	206 00
7 in.	183 00	232 00	219 00	268 00
8L in.	193 00	244 00	230 00	281 00
8 in.	222 00	281 00	265 00	324 00
9 in.	266 00	336 00	.....	.....
10L in.	246 00	312 00	294 00	360 00
10 in.	317 00	402 00	379 00	464 00

Terms, 2% 30 days, approved credit.
Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Boiler Tubes Revised Downward

BOILER TUBES.—Lower prices have been named on boiler tubes this week, wholesalers' stocks showing some improvement and the basis being gradually revised to what is now a pretty close price. The reductions average about ten to twelve per cent. There have been two prices ruling on tubes, one from warehouse which was about ten per cent. or so higher than a mill delivery. Now the same price applies all the way around.

BOILER TUBES—	Per 100 feet Seamless	Lapweld
1 inch	$28 00	$.....
1¼ inch	32 00	.....
1½ inch	35 00	28 00
1¾ inch	35 00	28 00
2 inch	40 00	28 00
2¼ inch	43 00	30 00
2½ inch	45 00	35 00
3 inch	52 00	40 00
3¼ inch	.....	47 00
3½ inch	62 00	48 00
4 inch	70 00	60 00

Plates Go Lower; Black Sheets Too

SHEETS, PLATES.—Lower prices have been reached this week on steel plate, and some slight reductions have been made also in black steel sheets. The base price on plates is down to $5.50 per 100 pounds. Warehouse war stocks are pretty well down, and with the new material coming in at the lower level this brings down the average of all the material in stock and the consumer is able to get the advantage of the lower rates. Warehouses are doing a very good business now and with general lines, in some instances February showing an increase over the same period a year ago. Range of quotations to-day follows:

BLACK SHEETS—	Per 100 lbs.	
10 gauge	....	$6 00
12 gauge	....	6 05
14 gauge	6 10	6 15
16 gauge	6 20	6 25
18-20 gauge	6 30	6 80
22-24 gauge	6 35	6 85
26 gauge	6 40	6 90
28 gauge	6 50	7 00
3-16 inch plate	....	5 75
¼-inch boiler plate	....	5 50

Prices shown are for full cases. An extra charge of from 25c per 100 lbs. is made for less than case lots.

GALVANIZED SHEETS—		
10¾ oz.	$8 50	$9 00
U.S. 28	8 20	8 75
U.S. 26	7 90	8 45
22 and 24	7 75	8 30
18 and 20	7 60	8 30
16	7 45	8 00

Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

Lead Pipe, Lead Waste Down 1c

LEAD PIPE, LEAD WASTE.—A further decline of 1c per pound has been recorded in lead pipe and lead waste this week, making quotations 12c and 13c per pound respectively. There is still no change recorded in prices on lead traps and bends.

Solder rules at unchanged levels from prices recorded last week and manufacturers report a fair movement in progress. Range of prices to-day follows:

Lead pipe lb.	....	$0 12
Lead waste pipe, lb.	....	0 13
Lead traps and bends	....	Net list
Lead wool, lb.	....	0 14
Lead sheets, 4 to 6 lbs., sq. ft., in rolls, lb.	0 11	0 12½
Cut sheets ½ to ¾c lb. extra and cut sheets to size, 1c lb. extra.		
Solder, guaranteed, lb.	$0 37	$0 39
Solder, strictly, lb.	0 33	0 37
Solder, commercial, lb.	0 31	0 36
Solder, wiping, lb.	0 30	0 32½
Solder, wire, lb.	0 45½	0 50
Zinc sheets, per lb.	....	0 20

Old Materials Revised Downward

OLD MATERIALS.—Lower prices have been named on many items, this being in line with information supplied through SANITARY ENGINEER last issue. Conditions in the trade are quiet and prices named are really only nominal. The basis prevailing to-day is as follows:

Dealers' Buying Prices—		
Tea lead	....	0 03½
Heavy lead pipe	0 04	0 04½
Pipe scrap	....	8 00
Stove plate, per ton	....	10 00
No. 2 busheling	....	8 00
Yellow brass	0 08	0 08½
Red brass	0 13	0 14
Light brass	....	0 06
Scrap zinc	....	0 05
Heavy copper	....	0 14½
No. 1 machinery cast	....	20 00
Wrought iron, No. 1, per gr. ton	18 00	19 00
Heavy melting steel	....	13 00

Lead Firming Up; Copper is Weak

INGOT METALS.—The lead market is showing some strength and prices have moved somewhat from low levels of a week or two ago. Copper is weak and tin is little changed. The feeling prevails that prices cannot get much lower considering costs to-day.

COPPER.—Quotations are really only nominal, the tendency still being downward, with apparently little regard for the cost. Prices named are around 20c per pound, but a lower basis could probably be secured by an actual buyer going into the market. The primary markets have broken badly.

TIN.—There is apparently little stock available and not a great deal of activity is noticeable. Prices rule around 58c to 60c per pound, but may go slightly lower.

SPELTER.—The situation is without any particular feature of interest. Supplies are small but only a fair amount of trading is being done. The price seems fairly steady at around 8½c per pound.

LEAD.—After reaching very low levels the market on lead has reacted somewhat, and 7c is considered a low figure to-day, with 7½c per pound thought to be more in line. There seems to be some inquiry, but trade is still somewhat small.

ALUMINUM.—The sign "nothing doing" still largely overshadows the outlook on this metal. Commercial interests are not buying and everyone seems to be waiting for the other fellow to start. Quotations are nominally held at around 50c per pound.

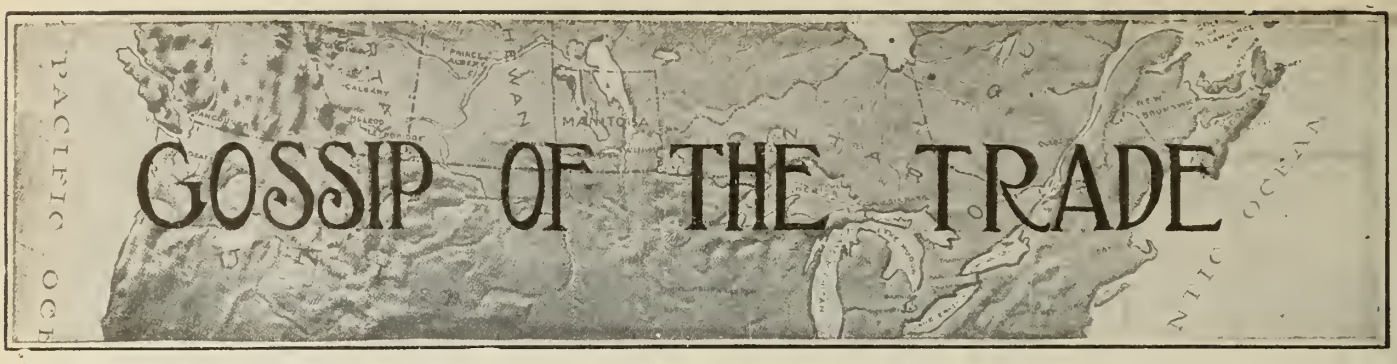
ANTIMONY.—Quietness, in fact dullness, is generally noted as the situation in antimony. Prices have held without change at about 8½c per pound.

NATURAL GAS FOR BOILERS

The San Joaquin Light and Power Corporation recently completed a 26-mile natural gas line to supply fuel to its Bakersfield steam plant. Natural gas is collected from wells in the Midway field and compressed to 250 or 300 pounds per square inch. The joints of the 6-inch pipe line are butt-welded by acetylene, no flanges or screw joints being used. About 6,800,000 cubic feet of gas per twenty-four hours can be delivered, this representing a possible saving of 1,100 barrels of oil per twenty-four hours. The boilers served include four 325 h.p. and eight 603 h.p. units. The gas pressure is reduced to from 0.75 to 2 lbs. at the boiler burners.—"Electrical World."

PIPE BENDER

A new pipe bender manufactured by the American Pipe Bending Machine Co., of Boston, enables 6 in. iron pipes to be bent cold. An illustration shows the apparatus in operation. A 90 per cent. cold bend may be made in a 6 in. iron pipe in 9½ minutes with six laborers handling the lever of the machine. The bends are as perfect as those made by any other process and are made at a labor cost of $1.50, whereas the average charge for making similar bends by other processes is about $25, and several hours are required to do the work.—"Electrical Review," Chicago.



GOSSIP OF THE TRADE

VISITING TORONTO

Ben Noble looked as if he was on the war path when SANITARY ENGINEER met him going into Cluff Bros.' office the other day. But upon referring to the coming convention to be held in Montreal, that honest full face of his simply became one big smile.

He is of the opinion that the convention should have been some time around the middle of April, or some convenient days before the real dry season gets its innings in Montreal. There are others of the same opinion, but let's hope that the novelty of a "dry" Montreal will be sufficient to attract a big crowd to the national convention.

MONTREAL MASTER PLUMBERS

At the last meeting of the Montreal Master Plumbers held in the Drummond Building, St. Catherine St., the membership list was brought up for revision, changes being considered necessary, and it being deemed best to have a good list.

J. E. Walsh introduced a discussion on the matter of the proposal of the Association of Building Industries, that the Master Plumbers' Association should be affiliated with this new association. The matter was briefly discussed and was subsequently left with a committee comprised of Messrs. Hughes, Saunderson, Latourelle, Ogilvie and Ballantyne, they to report later and bring in a recommendation.

Some discussion was also taken up re the Plumbing By-law of the city, and this matter will be further gone into. James Griffin was asked to bring in a report as to a curling schedule for the balance of the season.

VETERAN MASTER PLUMBER DIES IN MONTREAL

With a startling suddenness did the last call come to W. R. J. Hughes, head of the plumbing and heating firm of J. W. Hughes and Son, St. Antoine Street, Montreal. His passing was a shock to numerous friends, for Mr. Hughes had just finished an "end" in one of the successful curling games of the season on Friday, February 14, and, stepping into the apartment of the club house, collapsed, and in a few moments all was over. Although he had mentioned to a friend or two that he was not in his usual form, Mr. Hughes played the game well, and had scored high in his afternoon's playing, some of the best work of the season being put over by him.

A Life-Long Plumber

The late Mr. Hughes was a lifelong plumber. Entering his father's employ thirty-one years ago he engaged with what was originally the Richard Patton business, establish in Montreal in 1861,

MR. W. R. J. HUGHES

The Second Vice-President of the Montreal & District Master Plumbers' Association, who passed away suddenly on Feb. 15th.

and at the time of his first connection, known as Hughes and Stephenson.

After serving an apprenticeship of several years, Mr. Hughes went to New York and entered technical training in one of the leading trade schools. This extensive and technical experience, added to the practical knowledge secured here and at Montreal, fitted him for greater responsibilities, and when his New York course was completed, he returned home and was made foreman of the Montreal shop.

In 1903 Mr. Stephenson retired, and the firm name was changed to that of J. W. Hughes and Son, Mr. W. R. J. Hughes being admitted a partner with his father, the late J. W. Hughes. On the latter's death in 1912 the business continued as J. W. Hughes and Son, and a younger brother, A. W. Hughes, was admitted as a partner, who is still actively connected with the firm.

Having taken a keen interest in better plumbing and sanitation, Mr. Hughes was closely connected with his business, and was recognized as one of the first and most experienced men of the profession in Montreal. He was ever an advocate of superior work, and in speaking with SANITARY ENGINEER last fall he placed much emphasis on the need of all work being done well, and spoke in the highest terms of the importance vested in the modern master plumber.

Many Tributes Paid

Stricken at the age of 48, and a born mixer among his fellow men, it was not surprising that Mr. Hughes' untimely demise should be widely regretted. And among the most marked tributes paid to the deceased is the following from Mr. James Ballantyne, a brother master plumber To SANITARY ENGINEER, Mr. Ballantyne said:

> "There is nothing that I have felt so keenly as the sudden death of the late W. R. J. Hughes. I was talking to him on the morning of his death; he was in the best of spirits, and we were discussing the pleasant afternoon we were going to have with the American curlers, and the banquet that we were both to attend in the evening.
>
> "The late Mr. Hughes was an exceptional man in every respect. I have known him from boyhood, and he had always the same genial, pleasing disposition, and it was a pleasure to meet him at any time, either in business or at social events. He was the personification of uprightness and honesty in business. His word, like that of his late father before him, was as good as his bond.
>
> "We were very closely associated with each other in association matters pertaining to the trade, and his good judgment and advice will be greatly missed in matters of this kind. My heartfelt sympathy goes out to his bereaved wife and family.
>
> "In the passing of the late Mr. Hughes, the city has lost one of its most valued citizens, and I, like many others, have lost a great personal friend."

Out of respect to the memory of their late associate, the Caledonia Curling

Club, of which Mr. Hughes had been a member since 1891, and on a rink from which he was playing on this fateful day, they decided, at a meeting called for the purpose, to close the rink until after the funeral, and not to attend the banquet in the evening. At this banquet, feeling reference to Mr. Hughes was made by one of the visiting American curlers who had met him.

Other Honors Held

One of the most zealous curlers in Eastern Canada, the late Mr. Hughes had several coveted trophies to his credit, among these being the Gordon medal and Governor-General wins. He was also honored some time ago by being elected to the presidency of his club, a distinct tribute.

Ever taking an interest in athletics, and particularly in the younger set, Mr. Hughes was a supporter of the work done by the Montreal Amateur Athletic Association, and of this association he was last fall honored by being elected vice-president.

In his own chosen business, Mr. Hughes took a real interest from the larger standpoint, having held various important offices in the Master Plumbers' Association from time to time. He was a member of St. George's Anglican Church.

There are left to mourn his loss, Mrs. Hughes, formerly Miss Usherwood, and two sons, Lieut. W. U. Hughes, of the R.A.F., and H. H. Hughes.

Mr. W. U. Hughes is being admitted to the firm as a partner with Mr. A. W. Hughes.

RESOLUTION OF SYMPATHY

At a special meeting of the C. S. of D. S. & H. E., under A. Charette, presiding chairman, it was proposed by J. Watson and unanimously adopted, following resolution: "That this executive has heard with sadness the so sudden death of our confrere, J. W. Hughes; that our organization is losing a most esteemed member, the trade a prominent man; that a copy of this resolution be sent to the family of our esteemed confrere as a token of sympathy in their sad bereavement, also to the SANITARY ENGINEER."

A. Charette. Pres.
J. Watson, Sec.

MONTREAL MASTER PLUMBER HONORED

James Ballantyne, of James Ballantyne Ltd., Montreal, was again chosen this year by the citizens of Montreal West, as their mayor for 1919. It was the first time in many years that a contest was held, and after occupying the office of chief magistrate for eight years, Mr. Ballantyne's choice through popular ballot must have been gratifying to himself. His brief remark to SANITARY ENGINEER, when asked regarding the contest, was: "I guess some of the people thought they wanted a change but really did not."

Mr. Ballantyne has endeavored to give of his best for the welfare of this important municipality adjacent to Montreal. He looks for a healthy and consistent growth, and while he does hold to the belief that building activity in his own city, as well as elsewhere, will necessarily be deferred for six months or a year, he expects 1920 to be a winner. He believes that vacant property should, and must be built upon, if the best results are to be obtained and progress made.

NORMAL BUILDING TO RESUME GRADUALLY

Master Plumbers of Montreal Expect Gradual Change to Normal Building Activity—Some Work May Start This Year — 1920 to be Record-breaker — Making Munitions Taught Valued Lessons

PRESIDENT LATOURELLE, of the Montreal and District Master Plumbers' Association, looks for a fairly unchanged condition during 1919, as far as building activity is concerned. Asked as to what he thought of the outlook by SANITARY ENGINEER, and for his views on the new

President Latourelle, Montreal, thinks outlook for new business is good.

proposal for loaning money to municipalities that wish to erect homes for their citizens, Mr. Latourelle believed that there would be, if any, but a partial return to building in 1919. The price of all material was so high, and the inducements regarding building in general were so few, that those wanting housing would defer this, he thought, until lower prices would be available.

"We will take the illustration afforded by the City of Outremont, one of the adjacent sections of Greater Montreal. Supposing that a man wants to erect a $5,000 home. The city of Outremont will probably offer anyone wishing to build, free taxes for five years. These taxes might run about $100 per year. The money investment at $5,000 would mean, in interest, at least $250. Will the price of materials decrease enough to make it worth while to wait? That is the point a man wanting a house would consider, and it would seem that the inducement of free taxes for the period mentioned would not be sufficient to stimulate building. I do not expect there will be a great deal of building before 1920, but then it will perhaps be very active."

This is an interesting viewpoint. Mr. Latourelle did not deny that there might be some new work, but believed that this would be rather limited in view of the high cost of everything, and notwithstanding the great need, particularly for housing.

James Ballantyne's Views

James Ballantyne, one of the leading master plumbers of Montreal, stated to SANITARY ENGINEER that he believed there would not be a general revival of building during 1919, but was hopeful that some of the larger Government work would be undertaken. "The Federal Government is renting extra accommodation at present," said Mr. Ballantyne. "They need more room. Here in Montreal it may be, for instance, that the new Examining Warehouse will be extended." This building is at present but partly completed, that is, a large wing or section is contemplated. Recent rumor has it that this work will be resumed to absorb a portion of available labor not otherwise employed.

Mr. Ballantyne thought that there might be some building in a large way. "Only recently I was asked to figure on an apartment house of over 100 rooms and some work of this nature may be carried out. There is a good demand here for apartment accommodation."

This view was also somewhat shared by Mr. Latourelle, for, "A man can build several apartment sections for very little more than a semi-detached house costs. That is he can get several flats out of the same expenditure, and out of a given outlay could get rentals of $75 to $100 for two or three flats, where the house proposition would bring him much less, perhaps only $40 or $50. These apartments also are popular, many preferring them."

The above all has a bearing upon the plumbing and heating trade—very vitally indeed. It would appear that the trade here is alive to the possibilities ahead, and as Mr. Ballantyne pointed out, "There should be a great revival of building here in 1920; it should be one of the best years ever experienced."

Men More Efficient

One of the observations made by Mr.

Continued on page 32

Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

Open Fire Places

Editor, SANITARY ENGINEER.—I read in one of the newspapers a few weeks ago that some professor was of the opinion that open fire grates should be placed in workmen's houses, and that such appliances would not only heat the houses properly, but would also ventilate a room or rooms better than a furnace. I cannot figure out how this could be done and would therefore like the question put to you, Mr. Editor, to discuss in your "Question Box." Are there any particular kinds of open fire grates that could be used in Canadian homes that would be more than a mere toe-toaster or face warmer?

O. G. Inquirer, B.C.

We are not aware of any type of open fire grate that would be suitable for heating homes in all parts of Canada. It may be that, in certain parts of British Columbia, where very little frost is experienced, open fire grates can be advantageously used, and particularly those that contain water backs or coils, similar, for example, to those manufactured by Jas. D. Prior, Empire Works, Birmingham, and others.

These open fire grates are made in a score and one styles, with coils or cast water backs. They are filled with water, an expansion tank is fitted to same in just the same way as a regular hot water heating system. Radiators can be connected up to these grates and placed in small bedrooms, or even in the same room in which the grate is fitted. They hold a larger body of coal, and the flues in the chimney are properly controlled.

But, after all, nothing will take the place of the furnace as a 24-hour heating unit in the average Canadian home. It may be that smaller-sized furnaces will be made, particularly the warm air type. We believe that the workman has just as much a right to have his house efficiently heated with a small furnace as any other class of individual, and we hope to see the small hot water system or reputable kind of warm air furnace installed in the usual way in most of those houses which are soon to be erected to fill the urgent present need.—Editor.

Cheapening Plumbing

Editor, SANITARY ENGINEER,—The present housing schemes that appear to be "in the air" have in them, it seems to me, an element of danger, at least regarding that portion of the make-up dealing with plumbing and heating.

In a recent issue of SANITARY ENGINEER you warned the trade not to be carried away with the main idea of dollars and cents in connection with first cost of plumbing, if the cost in cash came to such a low level as to mean that a poor class of plumbing fixtures and piping would have to be installed, resulting in creating unsanitary conditions later on.

I was looking over a blue book just recently issued by the Ontario Housing Committee, and under the heading of plumbing I noted that this committee suggested some very radical changes in the methods at present looked upon as standard all over Canada.

For example, on page 40 in the book I refer to, and under Section 8, referring to vents. the following appears:

"The bottom of a vent stack shall also be joined to soil or waste stacks below the lowest fixture connection."

There are other matters which I feel can be subject to criticism, but I would like your views about the above suggestion, which, it seems to me, would tend to make plumbing much more expensive. I am hoping to see some plans worked out that will cheapen plumbing construction, providing that the work does not later become a menace to the health of our workmen, or become a big bill of expense in repair work afterwards.

O. W. O. For True Sanitation

In the first place it might not be out of order to state that the Ontario Housing Committee have already been approached in an indirect way by SANITARY ENGINEER and that it has learned that the suggestions referred to have all been withdrawn. But to give our reader a reply to his query regarding connection of the vent stack to the soil and waste stack below the lowest fixture, we would state that this is no doubt good practice. It is very desirable too, in many cases, but we are discussing workmen's houses, houses not to cost more than $3,500 including land, and it is proposed to allow workmen 20 years' time to pay for the house, so that it would be well to view this question from all angles. SANITARY ENGINEER is prepared to endorse cutting out any piping that verges on the point of expense that is not absolutely necessary, and in this case we do not feel the necessity of running a separate pipe from, say the vent branch above the water level of the lavatory at the bathroom to a point below the sink waste pipe, even though this may only mean connecting the top of the sink trap vent to the higher branch above-mentioned. Therefore, we would feel that the vent connection referred to in Section 8 is really not necessary.—Editor.

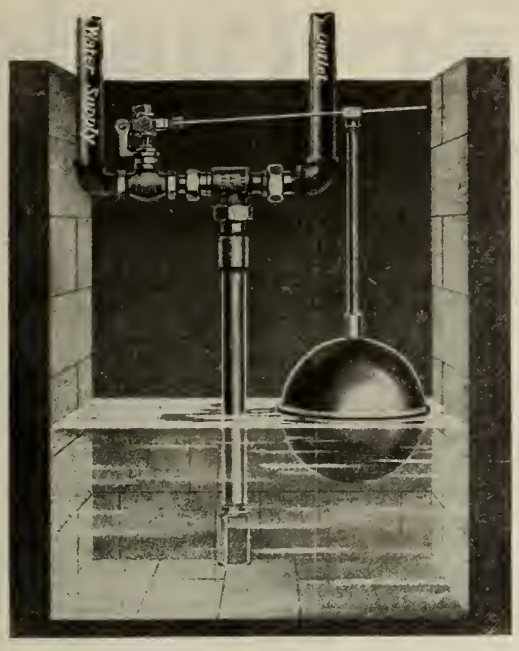
THE PLUMBER

A plumber is a busy man, especially when it freezes,
When the mercury drops down below and everybody sneezes,
When water pipes are frozen tight it puts things on the hummer,
You want the man there with the wrench; the man they call the plumber.

With lighted candle in his hand, he gropes about the place,
Through cobwebs old and dusty, to try and stop the waste.
A piece of pipe is broken, a trap, a bibb or two;
It takes just three full hours for him to fix up for you.

You're only one of many who want him right away
To hustle on and off the job—but when it comes to pay—
He was longer than he should have been; so cuss him up and down
But then, at that, what can you do—they're all the same in town.
This is your opinion of your plumber; but if you only knew
It might be a liberal education what your plumber thinks of you.

PETE FUSS.



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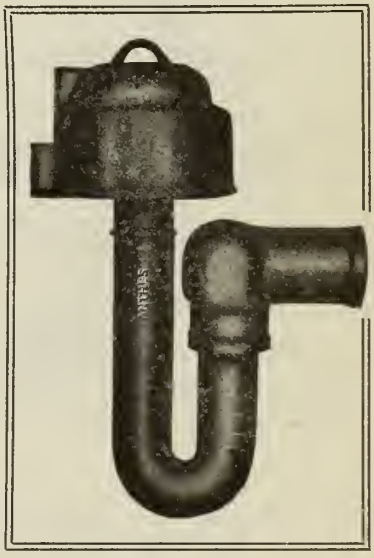

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Steel & Radiation, Ltd., Toronto.
Warden King Ltd., Montreal.

RADIATOR TRAPS (STEAM)

H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Canadian H. W. Johns-Manville Co., Toronto.
C. A. Dunham Co., Ltd., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

RANGE BOILERS

Toronto Hardware Mfg. Co., Toronto.

REDUCING PRESSURE VALVES

C. A. Dunham Co., Ltd., Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

ROOF FLANGES AND FLASHINGS

Canada Metal Co., Ltd., Toronto.
Simplex Manufacturing Co., Chicago.
Empire Mfg. Co., London and Toronto.

RUBBER GOODS

Canadian Consolidated Rubber Co., Ltd., Montreal.

SEPTIC TANK VALVES AND SYPHONS

Anthes Foundry Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
National Equipment Co., Ltd., Toronto, Ont.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

SOLDER

Canada Metal Co., Ltd., Toronto.
Hoyt Metal Co., Toronto.

SECOND-HAND PIPE

Consumers Metal Co., Ltd.

STEAM SPECIALTIES

Dart Union Co., Ltd., Toronto.
C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Kerr Engine Co., Walkerville, Ont.
James Morrison Brass Mfg. Co., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

STEAM TRAPS

George W. Cole Co., Ltd., Toronto.
C. A. Dunham Co., Ltd., Toronto.
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James Morrison Brass Mfg. Co., Toronto.

TANKS, STEEL

Wm. B. Scaife & Sons Co., Oakmont, Pa.
National Equipment Co., Ltd., Toronto, Ont.

TESTING PLUGS

James Morrison Brass Mfg. Co., Toronto.

TOOLS

Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Trimont Mfg. Co., Roxbury, Mass.
Williams, J. H., & Co., Brooklyn, N.Y.

UNIONS

H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Canada Metal Co., Ltd., Toronto.
Dart Union Co., Ltd., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.
Empire Mfg. Co., Ltd., London and Toronto.

VAPOR HEATING SYSTEMS

C. A. Dunham Co., Ltd., Toronto.

VITRO TANKS

Galt Brass Co., Ltd., Galt.

VACUUM SYSTEMS OF HEATING

C. A. Dunham Co., Ltd., Toronto.

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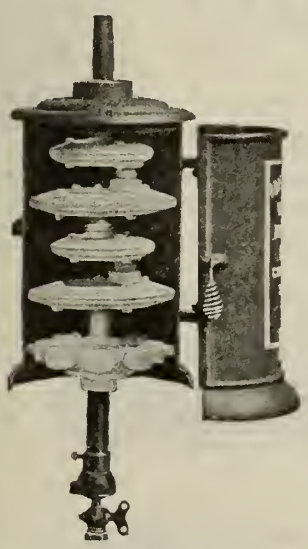
Wm. B. Scaife & Sons Co., Oakmont, Pa.
National Equipment Co., Ltd., Toronto, Ont.

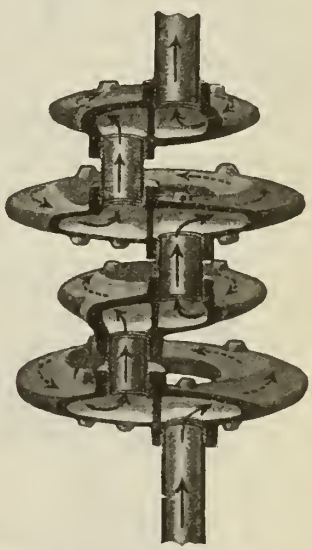
WATER SUPPLY SYSTEMS

Hurley Machine Co., Toronto.
National Equipment Co., Ltd., Toronto, Ont.
Empire Mfg. Co., London and Toronto.



The Completed Imperial Water Heater

We Put Good Money Within Your Grasp



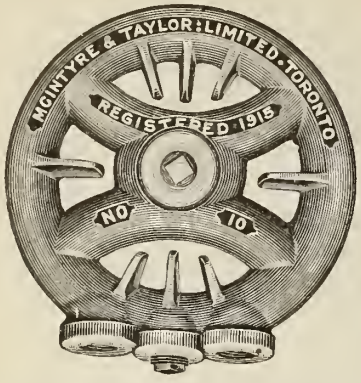
Sectional View Showing Water Flow

when we put the Imperial Gas Water Heaters on the market. They are undoubtedly the most economical on gas of any other make. They are not only easy on gas, but with the perfect circulation they

"HEAT WATER IN A JIFFY"

GOODWIN & COMPANY, Limited

Sarnia, Ontario, Canada



M. & T. COILS EXTENDED SURFACE

This is not a side-line with us. It is a specialty. We have taken out patents for these coils which have been designed upon the most scientific lines. M. & T. Coils are as carefully made as the highest grade of furnaces. Write for our catalogue and be convinced.

McIntyre & Taylor, LIMITED

TORONTO 501-3 Queen St. W. | MONTREAL 55 St. Francis-Xavier St. | WINNIPEG 156 Lombard St.

Steel Tanks for Every Purpose

A FEW "SCAIFE" SPECIALTIES:

Air Receivers
Boilers—Hot Water
Expansion Tanks
Filters (water)
Hot Water Tanks
Hydro-Pneumatic Tanks
Range Boilers
Tanks (steel)
Water Supply Tanks

117 years old. Founded 1802.

WM. B. SCAIFE & SONS CO.

New York, N.Y. Office: 26 Cortland St. Home Office: Pittsburgh, Pa.

"VALVENE" Discs (REGISTERED)

Specially prepared for Hot and Cold Water Taps. All sizes from ½ inch to 1½ inches. Soft, Pliable, and "Joint-Perfect."

Price List and Samples on Application.

THE COMMERCIAL INDIA RUBBER MANUFACTURING & SUPPLY CO., LIMITED
SOLE MANUFACTURERS 585 Commercial Road, LONDON, E.1.

IN THE BUILDING

OR UNDER GROUND

ASK YOUR JOBBER FOR T.H.M. CO. BRAND OF SOIL PIPE AND FITTINGS.

TORONTO HARDWARE MFG. COMPANY, - Toronto, Canada.

WE MANUFACTURE A FULL LINE OF HIGH-GRADE RANGE BOILERS

When Writing to Advertisers Kindly Mention this Paper.

ADVERTISING INDEX

A. & J. Mfg. Co. 40
Amherst Foundry Co.....Inside Front Cover
Anthes Foundry Co. 33
Beaton & Cadwell 39
Beaton & Corbin 40
Borden Canadian Co. 40
Byers, A. M., & Co. 4
Canada Metal Co. 2
Canadian Tube & Iron Co. 38
Canadian Wolverine Co. 7
Chamberlain Desolvo Co. 7
Commercial India Rubber Co., The.... 36
Consumers Metal Co. 40
Dart Union Co. .....Inside Back Cover
Dunham & Co., C. A. 3
Empire Manufacturing Co.....Front Cover
Galt Brass Co.....Back Cover and 11
Goodwin, F., & Co. 35
Gummer & Co., G. W. G. 5
Hall & Sons, John H. 38
Hause Mfg. Co., Chas. F. 40
Hoyt Metal Co. 38
International Malleable Iron Co. 9
Jardine, A. B., & Co. 3
Jenkins Bros., Limited 9
Kerr Eng. Co., Ltd.....Inside Back Cover
McDougall & Co., R. 39
McIntyre & Taylor 36
MacLean's Magazine 10
Moline Heat Co. 37
Morrison Brass Mfg. Co., Ltd., Jas..... 33
Mueller Mfg. Co., H. 31
Port Hope Sanitary Mfg. Co. 12
Scaife, Wm. B., & Sons 36
Simplex Manufacturing Co. 40
Standard Sanitary Mfg. Co. 1
Steel & Radiation, Limited 6
Trimont Manufacturing Co. 38
Toronto Hardware Mfg. Co. 36
United Brass Foundry & Engineers, Ltd. 32
Warden-King, Ltd. 39
Wells Bros. 8
Williams, J. H., & Co. 6

"The Heating Contract is Yours Mr. Jones"

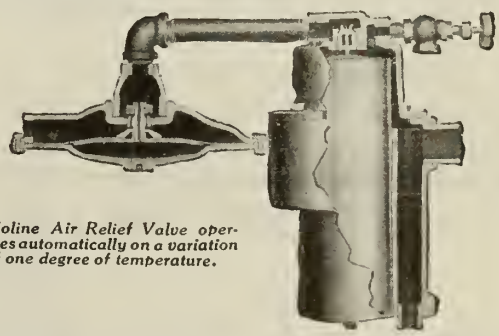
HEATING CONTRACTOR JONES (smiling): "If you don't mind my saying so, gentlemen, I *knew* I would get your contract as soon as I mailed my bid."

All the Committee, together: "What do you mean by that, Mr. Jones?"

Jones: "Well, Gentlemen, I knew I'd get it *because my bid was made on Moline Heat.* I knew that you gentlemen wanted *quality* in the building you are putting up and that it was not a matter of 'the cheapest bid wins.' Like all wise buyers, you want *quality first.* Wasn't I right?"

Chairman: "You're exactly right on that, Mr. Jones. The clinching arguments, to our minds, in favor of Moline Heat installation, were these attested statements you submitted from owners of buildings in every part of the United States, testifying to the *permanent* satisfaction given by Moline Heat. We cannot tolerate any heating troubles in our building after installation. And you have proved to our satisfaction that wherever Moline Heat has been installed it has given unvarying perfection of service."

Jones: "Thank you, gentlemen. When Moline Heat goes into your building, your heating worries are over. I have never installed Moline Heat anywhere without gaining other customers for it."



Moline Air Relief Valve operates automatically on a variation of one degree of temperature.

Numberless other heating contractors have had the same experience as Mr. Jones. YOU deserve as much success as other heating contractors. Climb on to the success wagon!

For full particulars write to us today

Some excellent territory still open for special sales representatives.

Moline Illinois

WROUGHT PIPE

BLACK and GALVANIZED
SIZES, 1/8 IN. TO 4 IN.

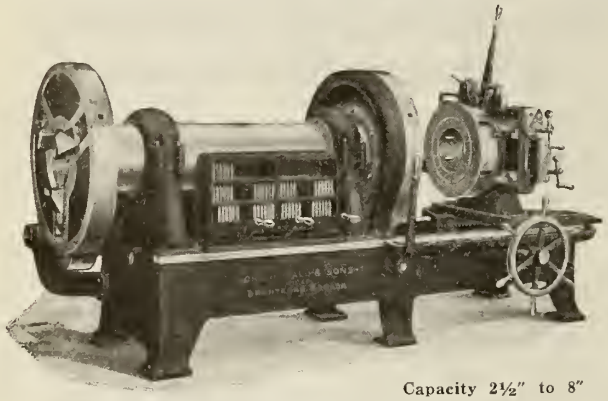
All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

All Sizes of NIPPLES (Black and Galvanized)

Ask your jobber for CT *Brand of Wrought Pipe*

CANADIAN TUBE & IRON CO., LIMITED, MONTREAL
Works: Lachine, Can.

Pipe Machines of Merit



Capacity 2½" to 8"

THE HALL No. 8

Duplex Improved Gear Box Driven. Capacity 2½ in. to 8 in. inclusive

Note the drive belt at rear out of operator's way. Elevated die cabinet, control lever and speed levers all convenient to operator's right hand. Sliding die head.

These machines are equipped with a friction clutch, enabling operator to revolve pipe a few inches, if necessary.

Pipe Machines ranging from ⅛ to 18".
Nipple Machines ranging from ⅛ to 4".
Roller Pipe Cutters ranging from ⅛ to 4".

Delivery from stock.

Write us for full particulars and prices.

John H. Hall & Sons, Ltd., Brantford, Can.

The Wrench of 25% Greater Efficiency

TRIMO PIPE WRENCH

Two new features have been recently added to the Trimo Pipe Wrench, namely Nut-Guards, in all sizes, and unbreakable steel frames, in leading sizes.

The Nut-Guards prevent the accidental rotation of the nut while in use.

These improvements add 25% to the usefulness of the tool.

The Trimo Pipe Wrench is made with wood handles in 4 sizes, 6-in., 8-in., 10-in., 14-in. and in steel handles in all sizes, 6-in. to 48-in. inclusive.

All Trimo Pipe Wrench parts are interchangeable.

The inserted jaw in the handle can be readily replaced when worn, thus adding to the life of the tool.

Nut with Nut-Guards

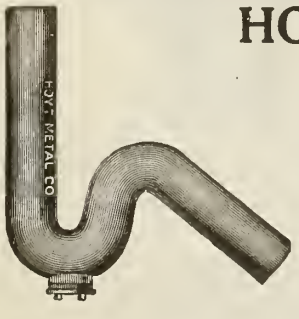
Inquiries from Importers and Dealers Solicited. Send for Catalogue No. 55.

TRIMONT MANUFACTURING CO.

Cable Address: Triwrench
Code: Western Union
Roxbury (Boston) Mass., U.S.A.

HOYT METAL GOODS ARE KNOWN

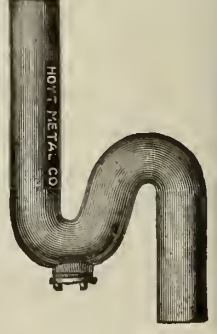
FROM COAST TO COAST



As time-savers there are none equal to our Wiping Solder, Bar or Wire Solder.

Hoyt Lead Traps, bends and waste pipe are in a class by themselves.

All our products are made to formula.



Our Mixed Metal Sales Amount To Over $5,000,000 Annually.

Write your Jobber

HOYT METAL COMPANY, TORONTO, ONTARIO
New York, N. Y., London, Eng., St. Louis, Mo.

Write Us

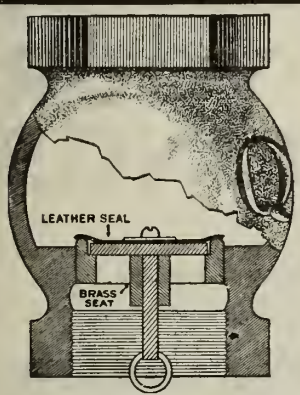
Over 60,000 Daisy Hot Water Boilers Now in Use—Are *You* Selling Your Share?

Daisy Hot Water Boilers are easiest to sell because they have an established reputation for exactly meeting the requirements of the modern home.

Every Daisy you instal will help build bigger business by bringing repeat orders for installation in neighboring homes later.

WARDEN KING Limited, Montreal

BRANCH OFFICE: 136 SIMCOE ST., TORONTO



This is a "Q" Foot Valve

And it Just *CAN'T* Leak

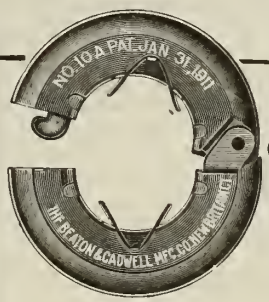
There are more pump troubles caused by "leaky" valves than from all the wear and tear which occurs in the average life of a pump.

The "Q" valve will overcome all priming troubles, and water once raised above it, through the suction line, will not leak out.

If you want the pumps you instal to give maximum, you will require to use the only valve on the market that JUST CAN'T LEAK.

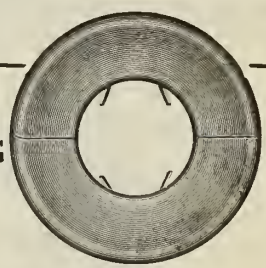
Made in sizes from 1 to 8-inch.

R. MACDOUGALL CO., LTD.
GALT., CANADA



OPEN VIEW NO. 10-A

The CEILING PLATE that's better



TOP VIEW NO. 10-A

THE NO. 10—A NARROW FLANGE PLATE—IS A STEEL HINGED PLATE. FLANGES ¾" WIDE. HIGHLY FINISHED. ESPECIALLY DESIGNED FOR TWIN CONNECTION "NARROW."

Gem No. 4.

The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

High quality at the right price.

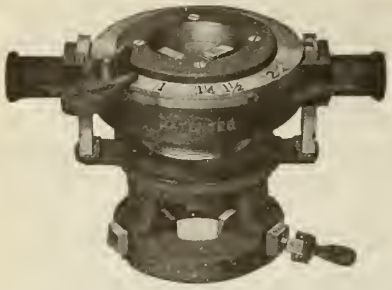
Gem No. 4 Automatic Air Valve

Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

Write for catalog showing our complete line of specialties.

The BEATON & CADWELL MANUFACTURING Co.
New Britain, Conn.

Eastern Agent: J. R. Devereux & Co., 358 Beaver Hall Square, Montreal. Western Agent: A. E. Hinds & Co., Chamber of Commerce, Winnipeg.



Ratchet

No. 6—¼" to ¾".
No. 25—1" to 2".
No. 26—1" to 2".

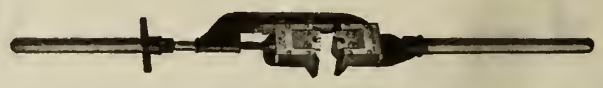
Geared

No. 41—2½" to 4".
No. 61—2½" to 6".
No. 80—4½" to 8".
No. 90—9" to 12".

PIPE THREADING AND CUTTING TOOLS

One Man Can Thread up to 12 Inch.

You cannot afford to expect your men to make horses of themselves. If they did they could not keep it up. Our tools save time, do better work and make life worth living for your men.



Cuts Without Burring

No. 1 cuts from ⅛" to 1"
No. 5 cuts from ½" to 2"
No. 10 cuts from 2½" to 4"
No. 15 cuts from 4" to 6"

The Borden-Canadian Company
TORONTO, CANADA

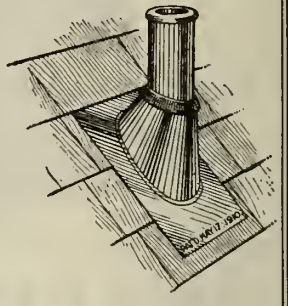
No. 1 B. & C. Automatic Radiator Air Valve

Made from the best brass with cast brass base. Screwed and soldered on, and equipped with high grade carbon. All valves tested before shipping. Use these together with our famous "B & C" Floor and Ceiling Plates and insure satisfaction.

The Beaton & Corbin Mfg. Co.
Southington, Conn.
Stocks carried by our Canadian Representatives
Canadian Representative: W. H. Cunningham & Co
183 Church Street Toronto, Ontario

The SIMPLEX Adjustable Roof Flange

Fits any roof from ½ pitch to flat—just slide it down the pipe and it will conform with the pitch of the roof.



Trade Price 2" $1.00 4" $1.15

Made in all sizes—For sale by nearly every jobber
Simplex Mfg. Company - Chicago, Ill.
183 Church St., TORONTO, ONT.
Canadian Representative: W. H. CUNNINGHAM & CO.,

Second-Hand Pipe

1-2" to 4"

Black and Galvanized

Send us list of your requirements

Consumers Metal Company, Limited
14 St. John Street MONTREAL
Works: LACHINE, QUE.

SAVE YOUR COUPLINGS

Write us what you have of the various sizes, either in pieces or pounds, and we will make you a cash price on them.

The A. & J. Mfg. Company
559 West Lake St. Chicago, Ill.

"HAUSE" PIPE JOINT CEMENT

For steam, water, air, oil, gas, gaskets, etc. The cement that cements. Sets like gum. Allows no leaks.

The Great Value of "HAUSE PIPE JOINT CEMENT" lies in its peculiar chemical properties which permits of its hardening and expanding after the joints are made up. In making up joints it has the same effect as a lubricant on the best graphite, and while the joints may be made and broken readily, a perfectly tight joint is maintained at all times. Comes in 1-lb., 5-lb., 15-lb., 25-lb., 50-lb. cans, 100-lb. barrels. Manufactured in ready mixed and powder form. Ask your jobber for prices, or write us direct.

Manufactured in Ready Mixed and Powder Form.

Made in Omaha, Neb., U.S.A.,

Canadian Distributors:

Empire Manufacturing Co., Limited
LONDON and TOROTNO

Kindly Mention

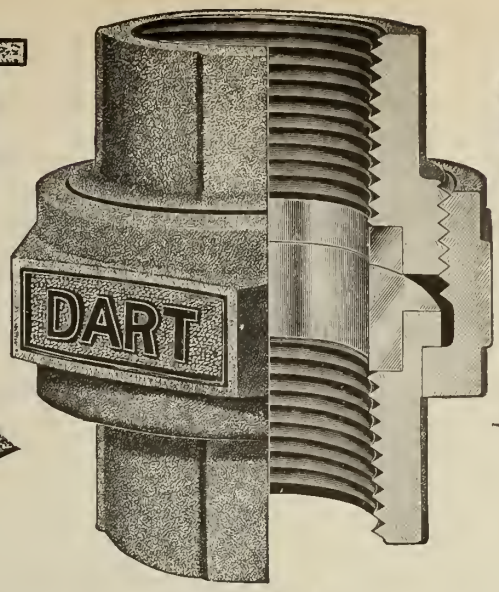
Sanitary Engineer

When Writing to

Advertisers

DART BRONZE

Union Pipe Couplings



To BRONZE at ← the Joint

Stay Tight—For Years

Dart Unions will not loosen up and leak because Face and Seat are of Bronze (a metal that will not rust or corrode) and the iron parts are of extra weight to guard against stretching, splitting or pulling apart.

Dart Unions will save you time. Connections are easily made—without bother—whether pipes are in or out of alignment, so long as the nut can be started on its thread.

Dart Union service means PERMANENT satisfaction to your customers.

MAKE SURE THAT THE "DART" IS SPECIFIED ON YOUR NEXT JOBBERS' ORDER.

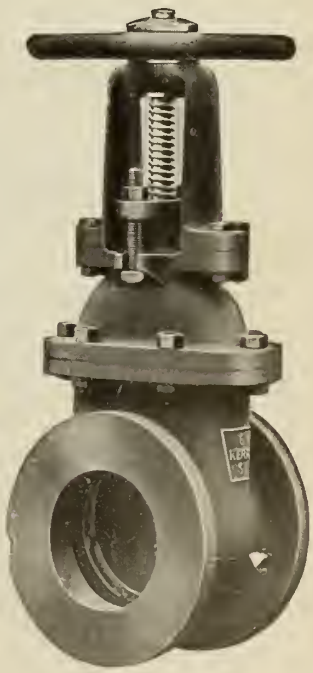
Manufactured by DART UNION CO., LIMITED, Toronto, Canada

There Are Lots of Gate Valves

Advertised and Sold

but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.

Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.

Approved by the Fire Underwriters' Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

VITRO TANKS have been in constant use under all conditions for which they are made and have not shown any signs of a leak.

IF Sanitary Engineers would consider for one moment that there are now over 350,000 in service and all as good as new.

THAT not one tank has been returned because of inferior quality. Material used has proved to be superior to any other

RELIABILITY is the Vitro slogan, because no other tank on the market can claim the value in service and durability.

OVER one million people on this continent find their homes contain a Vitro Tank, because one tells another when they get a good thing.

Let your next order for W. C. Tanks be

VITRO NO-TROUBLE TANKS

Every jobber handles them. No linings to leak, do not easily crack and have no joints to fall apart. Made in White, Oak and Mahogany finishes that will not crack or craze.

MADE-IN-CANADA

Galt Brass Company, Limited

Galt, Canada

SANITARY ENGINEER

PLUMBER & STEAM FITTER of CANADA

Vol. XIII. Publication Office, Toronto, March 15th, 1919 No. 6

A New Globe Valve and Where It's Made

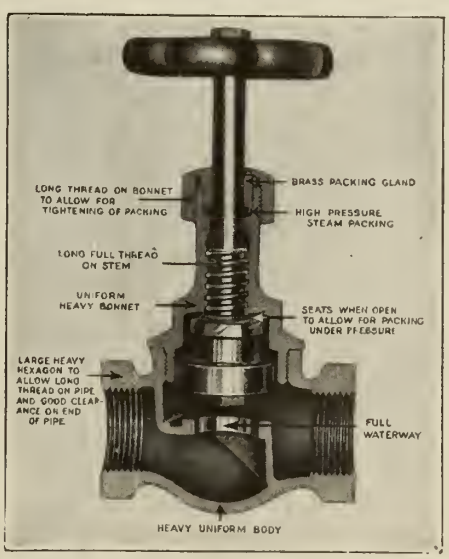
Just take a look at our

NEW EMCO

Globe Valve and note carefully a few of its good features. The long, full threads on spindle, the uniform thickness of metal.

It can be packed when open, is fitted with metal packing gland and is complete in every detail.

Every valve is packed with high-grade packing before it leaves the factory.


LONG THREAD ON BONNET TO ALLOW FOR TIGHTENING OF PACKING
BRASS PACKING GLAND
HIGH PRESSURE STEAM PACKING
LONG FULL THREAD ON STEM
UNIFORM HEAVY BONNET
SEATS WHEN OPEN TO ALLOW FOR PACKING UNDER PRESSURE
LARGE HEAVY HEXAGON TO ALLOW LONG THREAD ON PIPE AND GOOD CLEARANCE ON END OF PIPE
FULL WATERWAY
HEAVY UNIFORM BODY

This is only one of the many new lines we have made recently so as to fill some long-felt wants for high-grade valves.

We have one of the most modernly equipped brass manufacturing plants under the British flag.

We can make prompt shipments from stock. Let us quote you our prices on your next brass goods requirements.

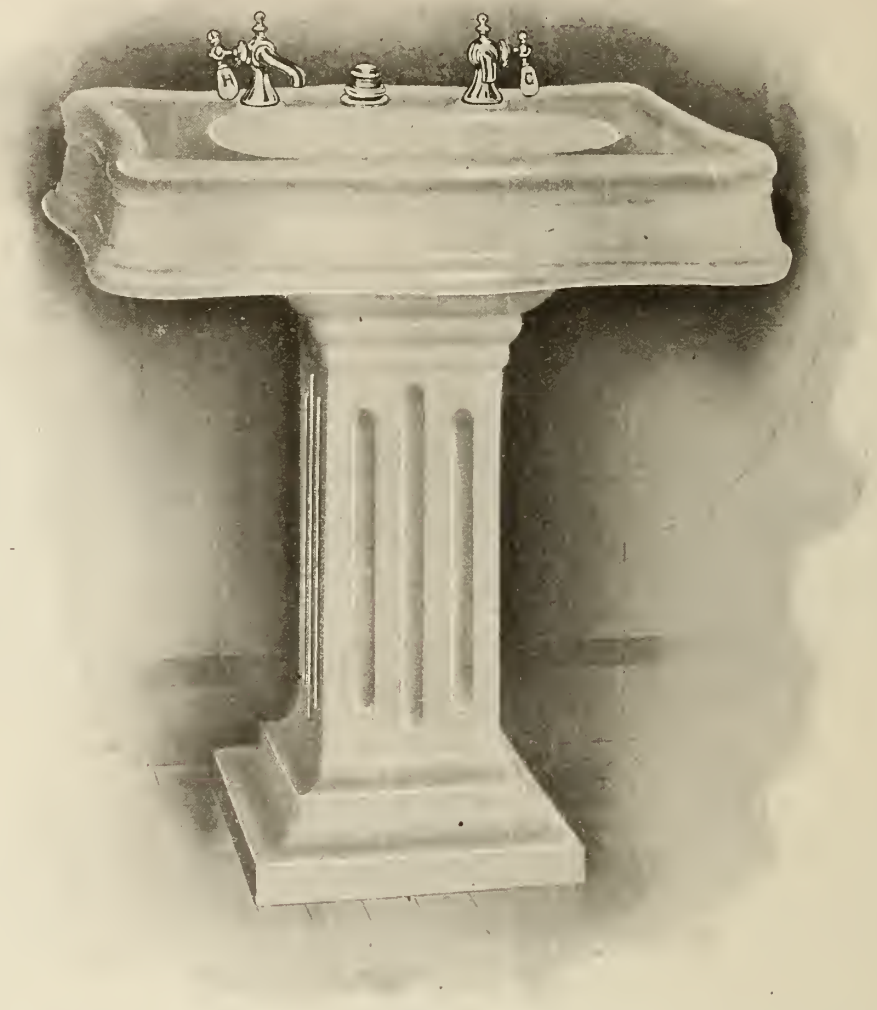
When writing us or ordering from your jobber, ask for the EMCO GLOBE VALVE. It's a winner and we're proud of it.

EMPIRE MANUFACTURING CO., LIMITED

LONDON TORONTO

SANITARY ENGINEER, March 15th, 1919, Vol. XIII., No. 6, published 1st and 15th of every month at 143-153 University Ave., Toronto, by The MacLean Publishing Co., Ltd. Yearly subscription price, Canada, $1.00; United States, $1.50; Great Britain and the Colonies, 4s. 6d.; elsewhere, $2.00. Entered as second-class matter at the Post Office Department, Ottawa. Entered as second-matter July 1st, 1912, at the Post Office at Buffalo under the Act of March 3rd, 1879.

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While



A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for **BEAVER BRAND CAST IRON ENAMEL WARE**

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

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MANITOBA and NORTHWEST:
E. B. Plewes, 120 Lombard St., Winnipeg

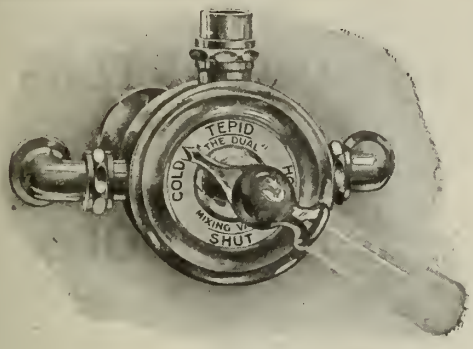
G. & W. G. GUMMER, LIMITED

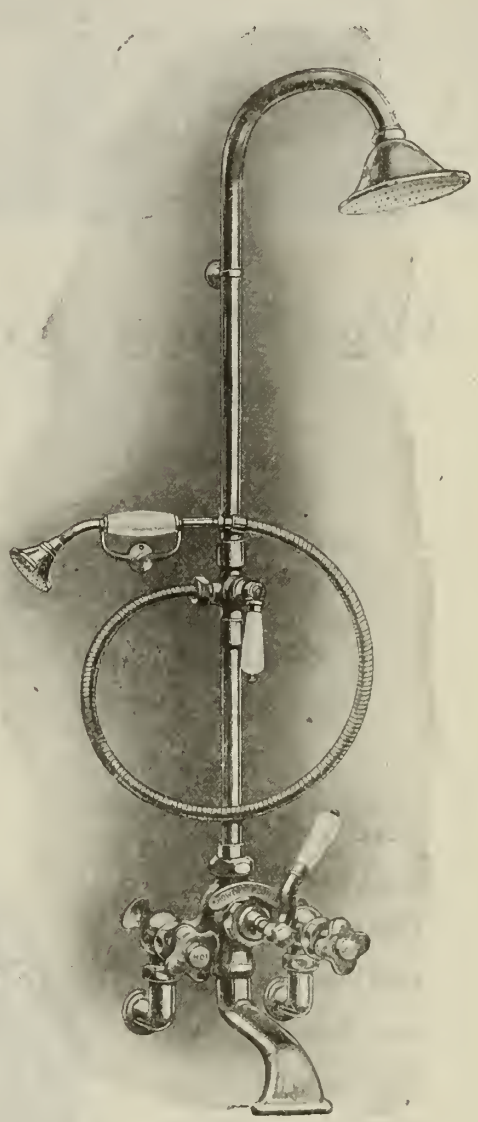
EFFINGHAM BRASS WORKS,

ROTHERHAM,

ENGLAND

And at
9 Fenchurch St.,
London





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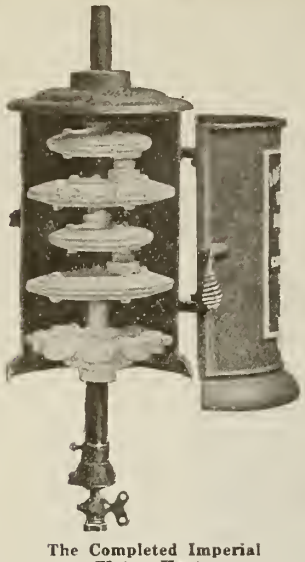

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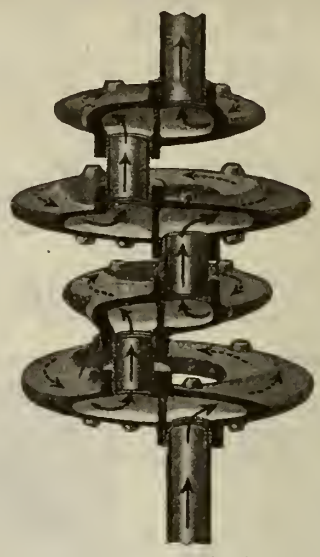

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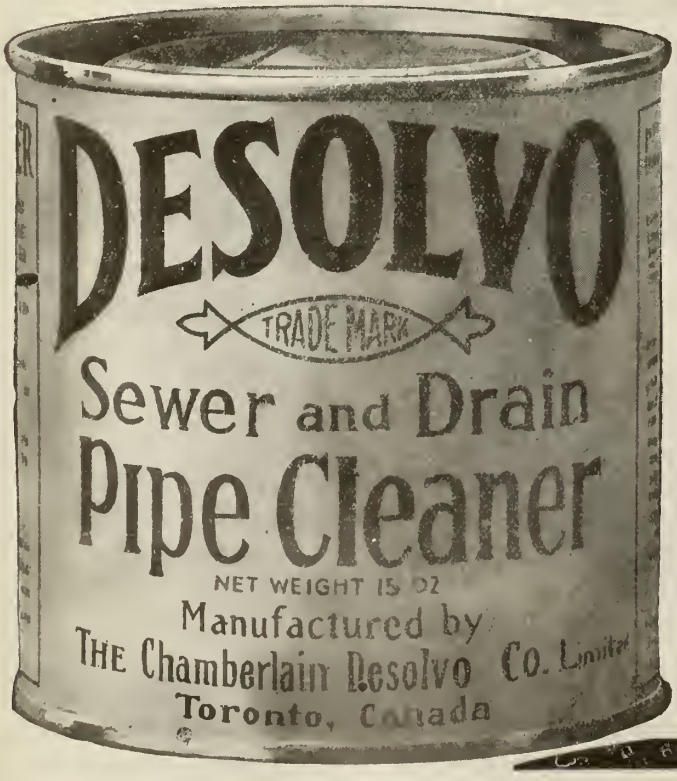

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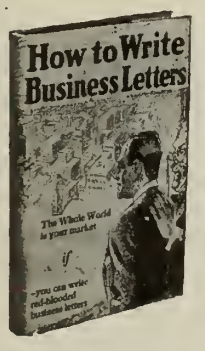

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"You BET we did, and it's the biggest job let this year!"

"FRED, you and I have been partners in the heating contracting business for fifteen years now; but did you ever stop to think what a partner MOLINE HEAT has been to us?"

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"Yes, and since 1911 we have handled *almost every heating installation in this territory!*"

"Fred, we can bet our last dollar on this—MOLINE HEAT is the best business-getter a heating contractor ever had!"

Many heating contractors, all over the United States, have had similarly remarkable records since handling MOLINE HEAT. If you wish to know how it's done write to us today.

Some excellent territory still open for special sales representatives.

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First Cost *versus* Upkeep Cost!

The purchase price means nothing if the upkeep cost is not low.

The purchase price of King Boilers is no more than the average boiler and yet—

The consumption of fuel—*the upkeep cost* is lower—considerably lower.

The thin, peculiarly shaped waterways in the "King" mean quickly heated water and perfect circulation, which causes a saving in fuel because it obviates the necessity of "extra firing" to move cold water from the radiators.

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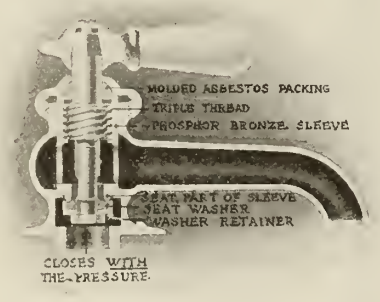

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If your customers complain of leaky Faucets and you want to make them smile, tell them you will put on

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Because they are almost leak-proof. You see they close with the pressure of water and that cuts out the chance of water getting through when closed. If, after long wear they should leak you don't have to take the body off, but simply change the sleeve, on which all the wear comes.

That's a good reason.

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With this brand mean fittings made with iron of high tensile strength—proper proportions and correct tappings.

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With this brand mean fittings made of Air Furnace Refined Iron, reamed and tapped to gauge with perfect threads.

Standard and Extra Heavy Flanged Fittings and Flanges. Galvanizing Malleable and Gray Iron Castings of all Kinds.

International Malleable Iron Co., Limited, Guelph, Ontario, Canada

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"The Mysterious German Onions"

On nights when the German air raiders were out, they sent up strange, luminous balls behind their lines and anchored them above the clouds—globes of fire which could be seen for forty miles or more. What these "onions" were, or how they were kept in stationary position above the clouds, is still a profound mystery. The Allies never learned anything about them, but the Allied night bombing crews steered their course to the Rhineland by the luminous buoys thus provided.

What is known about the onions is told by Lieut. J. Vernon McKenzie in the course of an article, "Raiding the Rhineland," in MARCH MACLEAN'S. It is an intensely interesting article, telling all about the great reprisal campaign which implanted the fear of war in the German civilian heart.

"NO HOPE FOR THE WETS"

"Already the temperance forces are lined up to stop any possible break in the prohibition dam," writes J. K. Munro, in discussing what is going to happen at the coming session at Ottawa. He predicts that Union Government will hold together, but that the habit it has contracted of promising everything asked is going to make a lively session. He expects:

Dry legislation at the earliest possible moment.
The moral reform forces in control.
No change in the Divorce Law.
Tariff concessions made to the West.

The March number, in fact, is full of live, up-to-the-minute features.
The famous Canadian Ace, Lieut.-Colonel W. A. Bishop is on the cover.

Some of the outstanding articles and stories are:

The Transformation (a new serial)—By Frederic S. Isham.
A Canadian King-maker (the story of Lord Beaverbrook in Britain)—By Maurice Woods.
Fitting in the Returned Soldier—By George Pearson.
The Three Sapphires—By W. A. Fraser.
The Strange Adventure of the Nile Green Roadster—By Arthur Stringer.
Fakers—and Others—By E. Ward Smith.
Lend Me Your Title—By Onoto Watanna.
A Shady Deal—By Archie P. McKishnie.
The City of Lost Laughter—By Mary Josephine Benson.

The Voice of Canada Interpreted

A new department starts in this number given over to summarizing and presenting opinion in Canada on outstanding topics, as reflected in the press. In this issue the department is given over to a careful compilation of opinion on the problems of the returned soldier.

Events of the World in the Remaking

Germany Ready for Trade War
Three-Year Marriages in France
No Solution in Ireland Possible?
Controlling Booze in Britain
Is Czar Still Alive?
Did Dr. Diesel Die?
The Secret British Ferry
The Poison That Didn't
The Problem
The German Spy in Holland
The Mysterious Sinn Fein Leader
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Hun Spies Outwitted
Will Trotzky Hire Huns?
The Achievements of Allenby

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A new tank will be given to replace one that any time proves defective from either material or defective workmanship.

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GALT BRASS COMPANY
Limited
GALT ONTARIO

BUILDING BUSINESS

Building business is showing marked signs of improvement. The improvement will be gradual and it may be some time before we return to the conditions which existed prior to the War, but all along the line from the Atlantic to the Pacific there is evidence of a renewal of building activities.

Governments, Municipalities and Housing Committees are directing their attention to the insistent demand for moderate priced dwellings, and plans under consideration may take shape at any time; in fact it is confidently expected that large building operations will be under way within a month or two.

It may surprise some of us how quickly we will return to normal conditions in the building line, and in the meantime there is the demand and we who manufacture, distribute and instal Plumbing goods should get ready to take care of the business. There is no better way than by systematic advertising, and whether the medium is through the newspapers, periodicals or other literature, you will find that your advertisement will be more interesting if you use illustrations of attractive bath-rooms, kitchens or laundry equipment.

As Manufacturers of Plumbers' enamelware doing business through the recognized Jobbing and Plumbing trade of Canada, we offer our assistance and will gladly take part in any advertisement campaign that may be inaugurated, and to every Sanitary Engineer conducting an advertising campaign we extend the use of any of the illustrations which may be found in our Catalogues or Booklets. When you find the illustration you think best for the purpose you are going to use it, write us and we will gladly send you an electro by return mail free of cost.

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SANITARY ENGINEER

VOL. XIII. MARCH 15, 1919 No. 6

Water Supply and Sewage Disposal

What it is Composed of—Different Kinds of Water—How to Filter Water—How to Store it and Raise it to Faucets—Quantity Per Person Defined, Showing Why Small Sewage Disposal Systems Must be Based Upon the Number of Persons Residing in a Rural Home

By One Of Us

WATER is composed of various elements, compositions, etc., because it is very much influenced by the kind of earth, rock or strata through which it flows or percolates. Let us take for example water procured from chalk springs. It will be found to be, as a rule, pure and wholesome, clear, sparkling, and of a slight bluish tint, and contains from 6 to 20 grains of mineral matter per gallon; and it is what would be called "hard," but softens considerably when boiled.

Now, with water from limestone and gypsum strata, though such water is "hard," it softens less when boiled and is not as wholesome as a beverage as "chalk water," though it is generally very clear and sparkling.

Water from gravel and loose sand is only as pure as the surroundings, for example: If a small sewage disposal system is located near to a water supply, and the system comprises a cesspool or leeching pool, the chances are that the water will be contaminated, though it may even be clear and sparkling and not unpleasant to the taste, yet it may be really nothing better than a slow poison.

Thus it is very necessary and desirable to have a septic tank as part of a sewage disposal system, rather than a cesspool, and once a good water supply has been procured, it is almost a sacred trust to keep it pure, because, without doubt, both pure water and pure air are the basis upon which all life exists.

There are too many people in our rural districts who are of the opinion that when sewage and other domestic washes are put "out of sight," they are "out of mind." This is wrong, and there are laws which prescribe proper methods of sewage disposal.

Water Can Be Purified

Water may be purified by filtration. It can be made to percolate through various porous substances, such as sand, gravel, charcoal, but where large quantities of water are to be filtered, either a very large filtration is necessary, or else some practical means of thoroughly washing the material through which the water is filtered.

Many persons hold the opinion that if a sufficient quantity of water is filtered for drinking purposes, that is all that is necessary. But such is not the case. It has been proved that water that contains certain bacteria, or even chemical properties, is harmful to the skin. When the body perspires, the pores open and skin diseases result.

Then there is need for water for cattle, which should be just as free from impurities as that necessary for human consumption.

Quantity of Water Per Person

As cleanliness cannot be defined in any concrete terms, it is rather difficult to set hard and fast rules as to how much water would be required per person to enable one to maintain a healthy condition in a whole household. But from actual observation it has been found that the quantity used largely depends upon the type of water supply system used.

For example, in some cottages, without water closets or baths, for which water is got from a hand-operated pump at a well, as low as 4½ gallons per person has been found to be the quantity used, with very imperfect cleanliness as a result. On the other hand, under the same conditions, where persons were more clean in their habits, as high as 7 gallons of water per person per day was used.

This subject, or rather that department of the subject of water supply relating to consumption, has been given a great deal of study, and it is now acknowledged by most authorities on this subject that 15 gallons of water per person per day would be a fair average as the requirements for a household, not, of course, allowing for any waste. This quantity to be divided under six headings, as follows:

Purpose	Gals.
For drinking and making tea, etc...	½
For cooking purposes	1
For laundry and clothes washing...	2½
For washing dishes, etc.	2
For water closet	4
For washing and bath	5
Total	15

But in Canada we use a great deal more water than that, and we waste a lot, under the guise of cleanliness. We do not value it except in rural homes, and, as stated earlier in this article, the quantity of water used depends upon the system of water supply adopted.

In rural homes it has been found that where a small hand-operated pneumatic water system is used, as low as 10 gallons per person per day is consumed. which quantity would allow a fair condition of cleanliness to be maintained.

Where a gasoline-driven pneumatic water system was in operation, a still larger quantity of water is used. While in cases where an electric driven and automatic pneumatic water system was used, as high as 50 gallons per person is sometimes consumed, or, at least, the pumping outfit delivers that quantity.

These conditions are brought about because of the fact that as the water requires less manual effort, it is used more freely. Not in every case with a view of greater cleanliness, because there are no degrees in cleanliness. A thing, or a person, or an animal, is either clean, or it it is not clean.

Sewage Disposal

Now, we will take up the question of sewage disposal, or rather, show what relationship there is between a water supply and a sewage disposal system.

Suppose that a small farm house is to be fitted up with a bathroom and kitchen, with hot and cold water at the various fixtures, bath, W. C., wash basin and sink. The reason we do not, in this case, include a laundry tub is because most laundry tubs are installed in the basement, and in that case it would be difficult to drain the laundry tub with a septic tank. unless by pumping the waste water to the higher level; though this may be done if room permits.

Suppose, for example, then, that a hand system was used, and four persons resided in this small farm house, 40 gallons, or, at the most, 60 gallons per day of water would be used. This water is all to be disposed of, plus any solid matter it may contain, which we know is not very much, and is so uncertain in quantity, that we need not take it into our

calculations. Very well, we are to dispose of, say 60 gallons of waste water or fluid, and the disposal system must take care of this waste, therefore, it will be seen that there is a relationship between the water supply and the sewage disposal system.

An ordinary septic tank, as most of our readers know, comprises receiving chamber and a dosing chamber. The first should be capable of holding one-half more than the latter, and, therefore, must be either deeper or longer than the dosing chamber. Let us then suppose that we must dispose of 60 gallons of sewage per day; remember, we stated "dispose," not merely "put out of sight." The first, or receiving chamber, is directly connected to the soil waste and drainage pipes, and should be capable of holding 90 gallons of fluid from the soil pipe to the bottom of the tank.

The dosing chamber, in which a syphon is fitted, should be of such a size as would permit 60 gallons of waste to automatically discharge, at most, every 24 hours. The average 3-inch syphon will discharge all the contents of this chamber to within 3 inches of the bottom of the tank, so that the tank would require to hold 60 gallons plus 3 inches at the bottom, from the high level to that point below.

Subsurface Pipe

Now, as to where this discharge should go to, many persons advocate that one lineal foot of 4-inch clay field tile pipe is sufficient per gallon of discharge, particularly when the ground is sandy loam or gravel. But the writer is of the opinion that such is not quite practical. For the purpose of explaining why such an opinion is erroneous, it should be remembered that a 3-inch syphon discharges not less than 80 gallons of fluid per minute, and some discharge as high as 90 gallons per minute. Now, if one foot of pipe is provided, only 90 feet at the most would be installed in the ground. And it would require 12 lineal feet of 4-inch pipe to hold one cubic foot of sewage, so that on a basis of 6½ gallons or so per cubic foot, one foot of pipe would only take care of ½ a gallon. No doubt, if the syphon discharged very slowly, and allowing for a certain amount of the fluid escaping through the porous soil, less than 2 feet of the pipe per gallon would be sufficient, but when we consider the rate of discharge, which is very desirable, too, it is always safe to provide sufficient pipe to take care of the whole contents, or, say, in this case, 60 gallon discharge. Therefore, in this case approximately 130 lineal feet of 4-inch pipe would be required. And it is safe to use such a rule for all sewage disposal systems.

Then there is the question of depth underground to which these pipes should be laid, and the nature of the soil that is suitable for such a system. Of course, the most desirable kind of soil would be sandy loam or gravel, with a light top soil of a few inches. And where such conditions exist, the pipes should not be laid more than 14 inches deep; that is a safe plowing depth. Where soil is inclined to be clayey, the trenches should be from 14 to 18 inches, and as much top soil and light sand and gravel procured to fill same around pipe as possible. In a case like this, the trench may be dug, say 20 inches deep, and a few inches of lose filling, broken stones, pebbles, coke, etc., laid in first; then the pipes should be placed in position with open joints and rough material laid over each joint to prevent the finer particles from washing into the pipes at the joints; then the pipes may be covered with the top soil, or other loose material that can best be locally procured. But on no account must clay soil alone be depended upon to absorb wastes from a sewage disposal sysinches deep, and a few inches of loose fillup the trenches, and flow, if at all possible, to a lower level, which may very possibly be the well or source of water supply.

To safeguard the source of water supply, it is always recommended that a sewage bed be laid as far away from a water supply as possible, and in such a way as to have all discharge flowing in an opposite direction to the location of the water supply. In conclusion we will show some of the most important matters to keep in mind when installing a sewage disposal system and septic tank.

First, that the septic tank itself does not dispose of sewage; that it is only a part of a sewage disposal system.

That the septic tank is made of concrete and should be absolutely water tight.

That after the tank has been built, a thin coating of special mixture should be made and plastered on the inner walls of the tank.

The mixture to be made up of 3 parts clean, sharp sand to 1 part cement, and that the sand should be first dampened with boiled oil by using about a quarter of a gallon to a pail of sand; then mix sand with cement and add water till the whole is about the consistency of plaster. Apply with a trowel quickly.

The sewage disposal pipes should be laid as level as possible, the main trunk line of pipes should be 4 or 6 inch glazed tile pipe with hub and spigot, and all these joints be made tight by caulking a small ring of oakum in first, then using cement and sand putty to fill out joints.

That not less than 2 lineal feet of 4-inch field tile pipe be allowed to each gallon of discharge, or 13 lineal feet to every cubic foot.

That if soil is clayey a special bed be prepared as described above.

That the most desirable kind of soil is sandy loam or gravel.

That septic tanks should in all cases be fitted with a water-tight cover and manholes in each tank.

That cast iron fittings for septic tanks are best, and less liable to breakage, and better and stronger joints can be made.

PROGRESS REPORTED BY ONTARIO HOUSING COMMISSION

The Ontario Housing Committee has issued a preliminary set of regulations to govern the standard of workingmen's homes. which, it is thought, the province may build.

The part of the plans of greatest interest to the trade is that the committee has declared itself against the English system of putting the bathtub in the scullery or kitchen.

Special attention is to be paid to insure a fresh air space at front and rear. Cellars are not encouraged, as being unnecessary and likely to become a place for rubbish and litter to collect. The committee is greatly in favor of detached houses, and emphatically against the tenement for which they declare there is no necessity in this country, and only gives a qualified approval of the Duplex group.

The houses are to be made as attractive and as compact as possible, as the work usually falls entirely on one woman. They are in three styles; four, five and six room houses. Of these, the six room contain three bedrooms, and the others two and one bedrooms respectively. The other rooms, in each style, are the living room or parlor, dining room, kitchen, and bath. The Board do not object to the combination of the dining room and kitchen to provide an extra bedroom, or of the dining and living rooms, so long as all three are not combined.

INTERNATIONAL MALLEABLE BUILD NEW FACTORY

At the meeting of the directors of the International Malleable Iron Co. held at Guelph last week, they decided to proceed at once with the erection of their new factory for the manufacture of pipe fittings for foreign and domestic trade. The building on which construction will be started as soon as the plans are confirmed, will be 160 by 60 feet, and of three stories in height. This building is but an addition to an already large plant.

BRIDGEBURG TO COPY GRIMSBY

The new settlement basin at Grimsby has proved satisfactory and dependable in every way. Mayor W. T. Malkin and Reeve J. H. Atwood, of Bridgeburg, inspected the basin recently, and are thinking of installing like equipment at Bridgeburg at a cost of about $4,000. A short time ago electric pumps were installed in the municipal pumping station, but they have been handicapped, owing to the fact that weeds, small fish, etc., from the Niagara River periodically blocked them. The proposed basin is expected to overcome this.

Wisconsin Apprenticeship System

One of the Most Important Problems of the Day — A National Policy is Necessary— Wisconsin, U.S.A., Adopts Some Very Practical Methods Under the Direction of an Industrial Commission

Published in bulletin form and issued by the Industrial Commission of Wisconsin, Madison, Wisconsin, 1919

INTELLIGENCE and skill among industrial workers is the basis of both good citizenship and national prosperity. The education of men and women engaged in industry is a matter of vital concern to the state. Any plan to train the youth of the state with a view to produce a generation of skilled and intelligent workmen is of paramount interest to the public. It is to further this public interest that the apprenticeship law, Chapter 133, Laws of Wisconsin, 1915, was enacted. This bulletin is issued to describe the apprenticeship program adopted for the plumbing trade in the State of Wisconsin under the law. It is intended primarily for the trade so that a clear presentation may be had of the law, the machinery, and method of its enforcement, together with the rules and regulations which have been agreed upon by the Wisconsin Plumbers' Apprenticeship Board. There is every reason to believe that the new plan of apprenticeship to which this bulletin is devoted will, if consistently followed, afford the plumbing apprentice a favorable opportunity to master plumbing essentials, and will make for more skilled craftsmen, foremen, superintendents, managers, and master plumbers of the future, and thus serve the best interests of the plumbers and the public which they serve. What is accomplished in this particular trade can, in principle, be arranged for other trades, particularly in the building line, because, although details may differ, the fundamental conditions are the same. It is hoped that this bulletin may be of service to the master plumbers, the journeymen, and all others interested in apprenticeship, and moreover, be of service to other industries.

How the Public Will Benefit

A proper apprenticeship system, carried on efficiently and continuously, will develop a generation of trained plumbers worthy of succeeding the journeymen and master plumbers of the present. As a result of improper selection of apprentices and lack of sympathetic direction and helpfulness toward the apprentice by the master and journeyman plumber, a low grade of apprenticeship has been the rule, resulting in most instances in a correspondingly low grade of plumbers. This condition of affairs has proved a costly experiment—not only to the plumber, but to the general public as well.

To have proper training for one's life work pays not only in dollars and cents, but in self-assurance and honest pride, in the knowledge of skilled work and competent service performed. The untrained and the misfit apprentice tends to lower the standard of plumbers and plumbing, and ultimately means the decline of that reputation for superior service which the general public has a right to expect.

Wisconsin is the pioneer state in recognizing these needs. This state in 1915 passed a law providing for the indenturing of apprentices in all recognized trades, and this law is only a part of more general legislation which provides for compulsory vocational training of all industrial workers under certain ages. Even the federal Government has enacted a comprehensive law for the promotion of vocational education and has appropriated millions of dollars, increasing in amount for a period of ten years, to supplement state and city expenditures for this phase of education.

The result looked for is the elimination of a condition which to-day leads to one out of five apprentices in the plumbing trade leaving it before acquiring sufficient skill to become of real value to the community.

General Conditions of the Plumbing Business

Plumbing is one of the well-known building trades. It is a trade the product of which is stationary. The product of a plumber's work cannot be transferred from one community to another or from one state to another, but must be performed upon some building and performed at its final destination. In other words, the work of a plumber connects directly with the good or the evil, as the case may be, of the community in which he works.

The plumber deals with metals and sanitary fixtures chiefly. He must, however, be very adept in the use of tools, and the work is such, if properly performed, as to demand a high grade of intelligence and skill.

Modern plumbing is a great factor in maintaining and extending the hygiene of the home, and contributes to the maximum comfort of those who enjoy its advantages. It is now recognized more than ever before as a necessary sanitary improvement in the home, office, and factory. On the other hand, insanitary installations are inimical to the health of the public, and so vital is the work of a plumber that its neglect may mean the spread of disease and sickness such as to jeopardize the lives of thousands. For instance, a plumber must deal with the installation of water supply, and who can underestimate in this age the importance of adequate and wholesome water supply?

No less important is the problem of sanitary drainage and all work which a plumber performs pertaining thereto. In no branch of mechanical science has there been more noteworthy progress than in general plumbing, particularly with reference to water supply and drainage. Once regarded as incidental features in connection with building construction, these problems are now considered as items of extreme importance, requiring for design and installation the efforts of specially trained artisans, having the ability necessary to impart to others the fundamental principles underlying the design, construction, and care of installations.

The realization of this condition has made a technical education a necessity in the plumbing and domestic engineering field. There was a time when all that was required of the workman was a knowledge of handling tools and connecting pipes. This, however, is no longer the case, for an intelligent public, appreciating the disastrous results which may accrue from defective work, now insists that all sanitary work must be performed in accord with scientific principles. These facts have forced the state to see the necessity of proper apprenticeships in so vital a trade. Not only must the state and municipalities make regulations and ordinances to protect the public against improper plumbing, but there must be also a system of education which will create better plumbers and train the youth in this trade so that they may be an asset to themselves, a boon to the community, and a pride to the state, and not a liability to anybody. It is with this end in view that the apprenticeship system has been instituted and organized, and it is with these results in mind that we hope the trade will co-operate with the state to the utmost.

The Apprenticeship Plan

A solution to apprenticeship cannot come where either one or the other side of the trade assumes exclusive control. Apprenticeship controlled entirely by the employees, or the union, is bound to meet with dissatisfaction on the part of the employers, if not of the boys. On the other hand, apprenticeship controlled entirely by the employers without regard to the rights of journeymen in the trade is likewise sure to bring unsatisfactory experience. This has been borne out in the past, and the twenty years of discussion

in trade associations in the plumbing business have revealed the decline of proper apprenticeship in the trade, and have also brought to light the troubles which arise when either the union or the employers attempt alone to govern apprenticeship. Effective administration of apprenticeship must come through joint control, and that joint control is best assured when the state takes a hand and administers the regulations with the interest of the public at heart. This interest is chiefly in the welfare of the apprentice who is to be the future tradesman.

In the interest alike of the public, of masters and journeymen, the apprenticeship law, Chapter 133, Laws of Wisconsin, 1915, was enacted. This Statute is based upon two fundamental principles, one that there shall be neutral control over apprentices, and the other that apprentices in the trade shall have their agreements in writing. The first principle is established by the fact that the Industrial Commission is given the "power, jurisdiction and authority to investigate, ascertain, determine and fix such reasonable classifications and to issue rules and regulations and general or special orders as shall be necessary to carry out the intent and purposes of section 2377 of the Statutes." The second principle is established by the fact that the law requires all learners of any trade, craft, or business who are minors to enter into a written agreement. This written agreement contains the conditions of the apprenticeship stated thereon, a copy of which is to be filed with the Industrial Commission at Madison.

The law requires the signatures of the parties to the contract, the date of beginning apprenticeship, the period of duration of apprenticeship, the processes or parts of the trades to be taught and practised, the amount of wages to be paid, and any other special arrangements which are customary in the trade. The law requires furthermore that the apprentice shall attend an apprenticeship school for supplementary trade instruction five hours per week on the employer's time, where such schools are established. It is required by law that such schools be established in all cities over 5,000 and may be established in cities under 5,000. These schools are supported entirely by public funds. They are designed to give academic trade instruction to the boy as well as to afford him trade experience in the shop. Penalties are provided for violation of contract which will involve a fine from $1 to $100 for either party; in addition, the regular penalties follow for the violation of the orders of the Industrial Commission, which are the same as violations of any other order of the Industrial Commission.

It is realized by the Industrial Commission that to obtain the best results for the trade with reference to the making of skilled mechanics it is necessary to consult the trade freely and to make the apprenticeship, so far as possible, a trade autonomy. The commission hence requested the State Association of Master Plumbers to nominate three men to serve on a board to be known as the Wisconsin Plumbers' Apprenticeship Board. It also appealed to the State Association of Journeymen Plumbers to nominate three persons from their ranks to serve on this board, under the auspices of the Industrial Commission. The State Board of Health was invited to place upon that board its representative of the plumbing trade, inasmuch as the supervision of plumbing installations and licensing of plumbers is under the jurisdiction of the State Board of Health. As a consequence the Wisconsin Plumbers' Apprenticeship Board was organized as follows:

Representing the State Association of Master Plumbers:

F. C. Kuetemeyer, Milwaukee, Wisconsin.

J. E. Robertson, Milwaukee, Wisconsin.

A. S. Dahl, Milwaukee, Wisconsin.

Representing the State Association of Journeymen Plumbers:

Leonard Mathews, Janesville, Wisconsin.

Fred Heise, Milwaukee, Wisconsin.

Ed Thal, Racine, Wisconsin.

Representing the State Board of Health:

Frank R. King, State Plumbing Inspector, Madison, Wisconsin.

Representing the Industrial Commission:

Stewart Scrimshaw, Supervisor of Apprenticeship, Madison, Wisconsin.

These men have been called together on several occasions and have worked out the solution which is herein contained. A great deal of consideration has been given to all phases involved, and it is realized that while no system could meet with universal satisfaction, the present proposals have received such unanimity of support as to offer high hopes of reaching a working solution of the apprenticeship problem in the plumbing trade in Wisconsin.

The apprenticeship matter was presented to the State Association of Master Plumbers by the state supervisor of apprenticeship at their annual convention under date of January 15, 1918. At that convention the association passed the following resolution:

"RESOLVED: that we, the Wisconsin Master Plumbers' Association, assembled in Milwaukee this 15th day of January, 1918, do pledge our cooperation in the enforcement of the apprenticeship law, Chapter 133, Laws of Wisconsin, 1915, and we will conform to any orders and rules governing apprenticeship in the plumbing trade which are the result of the deliberations of the Wisconsin Plumbers' Apprenticeship Board, and that we will furthermore take any other step necessary for the improvement of skill in the plumbing trade."

Under date of July 6th, the apprenticeship scheme was presented to the State Association of Journeyman Plumbers at their convention in Janesville, and as a result the following resolution was carried:

"RESOLVED: that we, The Wisconsin Association of Journeymen Plumbers, Steam, Gas and Sprinkler Fitters, assembled in annual convention at the city of Janesville, Wisconsin, July 6 and 7, 1918, do concur in the plumbers' apprentice indenture plan as formulated by the members of the Wisconsin Plumbers' Apprenticeship Board, and that we extend such assistance as will promote the best interests of all concerned."

It is needless to say that many difficulties will arise from time to time in the administration of this work, but by carrying out the broad general principles which are outlined and by the exercise of good-will on both sides, with full confidence in the good faith of the commission, all difficulties can be adjusted.

The apprenticeship system involves fundamentally three things: The contract, that is the formal agreement; the trade schedule, that is Exhibit A of the apprentice indenture; and the general rules for administration. The form of contract is determined by law. The schedule is determined by the Wisconsin Plumbers' Apprenticeship Board and is designed to meet the requirements of the law. The rules of administration are more flexible and are intended primarily to carry into effect the schedule, or Exhibit A.

The form of contract, shown on page 15 of the bulletin, is the result of many conferences and considerable deliberation by the general State Committee on Apprenticeship representing employers and employees. It was drawn up so as not only to conform to the law, but to make a just document for both employers and apprentices. It was necessary to have a contract that could be used for all trades and for all kinds of apprenticeships. On this form the mutual agreement with the names of the parties, etc., is contained on the first page, on the back of which is the text of the law. On the third page is stated the particular terms of the contract which refer to the individual trade, known as "Exhibit A." It is here where the chief consideration of each particular trade is involved and where the work of the trade apprenticeship committee is required.

For the plumbing trade the Wisconsin Plumbers' Apprenticeship has adopted the following trade schedule which will be Exhibit A of every apprentice indenture:

"The term of apprenticeship shall be five years, each year to consist of at least 275 working days, the first three months of which shall constitute a probationary period."

Exhibit A With Explanatory Notes

Extent of period of apprenticeship:

"The term of apprenticeship shall be five years, each year to consist of at least 275 working days, the first three months of which shall constitute a probationary period."

The length of this apprenticeship is based upon universal trade experience in the largest cities throughout the country, and in view of the fact that considerable time is required to make a good plumber, the effectiveness of whose work involves so much the health of the public, five years was agreed upon as the standard term. Two hundred and seventy-five (275) days are designated as the standard year so as to avoid any misunderstandings which may arise because of

(Continued on page 22)

Motor Truck Service

How Other Industries Make Use of Motor Trucks—How They Check Up Cost and Charge Same Up to Their Cost of Doing Business

By One Of Us

BEFORE going into a number of the details regarding motor truck service, it will be of interest to refer to the article which appeared in last issue of SANITARY ENGINEER and recall some of the remarks made by a number of our readers in connection with the service they received from cars and trucks used in their business.

One user stated that he did not know how he had ever got along without a car. Another declared that, while a motor truck cost forty per cent. more than a horse in upkeep, seventy-five per cent. more service was procured. Another user of a truck said that he and his brother, between them, were actually doing more work than four men did before they bought it. They hired 2 men at one time, and one of the brothers did the bossing of the other three; now both brothers were doing real work. A stenographer looked after the books, and their business was growing amain. None of the users of either trucks or cars would consider for one moment dispensing with them at any price.

It may be argued that many a man starting in business for himself and by himself, not expecting to employ any men for the time being, could not very well afford to buy a car or truck, and when we say "afford," we mean that he may not have capital enough to acquire one at the start. That is only one side of the argument.

When a man starts in for himself there is one thing he must keep in mind, and that is: that time is his only real asset, and to conduct a successful business he must plan to save time. When we say "save time," we mean that he must turn as much of his time into "charged accounts" or cash accounts, as possible, and to do that every moment is valuable.

The writer was once discussing the why and wherefore of things made with a number of young lads, and told them that nothing material, physical, mental or elemental existed that had not some specific purpose. One lad asked, Why adversities? Why wrong? Why street cars? Why trucks? Why autos? And the writer turned and asked some of the lads present to answer at least the more simple questions, for example: Why autos? The first boy to speak, replied that he thought that trucks and autos were mainly in existence to save time. Yes, of course, save time; and as we stated earlier in this article, time is the chief asset in this world; time is not material, it is gone, never to come back. Material has a price, but time is priceless, and therefore should be made most of by all. The poorer a man is, the less he can afford to waste it.

One young fellow, speaking, not long ago, as to how he acquired his truck, said that he, first of all, bought a motorcycle for $100, paid for it on easy terms; simply taking a few tools in a bag with him to a job. He earned enough the first six months to pay for the motorcycle outright, and added to it a side-car; made a presentable looking tool box, had his name painted thereon and used it for nearly a year, and in less than two years he had earned enough surplus cash to buy a two-passenger automobile. He took the back portion of the car apart and fitted it up so that he could put a short truck body to it, making this interchangeable, so that he could replace the rear part of the auto, thus enabling him to use his car in the evenings for pleasure, and the change can be made in 15 minutes.

This man declares that he can now do as much work in a day himself, and make as much profit as if he employed 3 men. Thus it will be plainly seen that the man who must make the most of his time must, in some way or other, secure some speedier method of locomotion than "Shank's mare," or street cars.

The writer has read many works regarding this motor truck problem, and in none of them has the author taken up the question as to the benefits which such an appliance would be to the "little fellow." But it must be at once admitted that if a big concern can save time and money by using trucks, surely the little fellow, whose only asset is time, would find that a truck or car would be a benefit, and is a necessity to him.

Here is another very unique, or rather a simple story, giving the experience of a "little fellow." Said he: "I bought a horse and wagon, and used it for two or three years. I only ran a one man business, and the horse feed cost me on an average in those days, $14.00 a month. I owned the shop and stable, paid $1,000 for the property. It cost me $15.00 a year for harness repairs, shoeing and other little expenses; cart grease and wagon repairs amounted to about $50.00 a year, so that I reckoned that it cost me about $230.00 a year for the horse and wagon."

Well, one of those travellers selling cars called on me one evening, just as I was putting up the horse for the night, about 6 p.m., and wanted me to talk motor trucks, but I was busy and said he'd better call later. I meant some other day, of course—but he called later alright, about 8 p.m. the same night, and, Mr. Editor, he told me things that made me sit up and take notice. He took my figures as to cost, and this is how he worked out my cost. See Table I:

TABLE II
COST OF HALF-TON TRUCK UP-KEEP

Two gallons gasoline, 15 miles per day, 15 miles per gallon, at 20c, 350 days per year	$140.00
Repairs, grease, tires, etc., 350 days, at 60c per day	210.00
Truck investment, $600.00, at 7 per cent.	42.00
Depreciation, 20 per cent. (This is too high)	120.00
Insurance, per year	10.00
Accident insurance, per year	10.00
Total up-keep	$532.00
Less 1½ hours' time saved at 75c, 300 days	$339.00
Making my actual cost of motor truck as against cost of horse	$193.00
Truck saving would be	$508.90

A better service, more work and better at less manual labor cost to a one-man business.

TABLE I
COST OF HORSE UP-KEEP

	Per day		Per year
Horse feed	$ .46	(365 days)	$167.90
Harness repairs, etc.	.05	300 working days	15.00
Repairs, wagon, etc., grease	.16 2-3	300 working days	50.00
Stable investment, $1,000	.19 1-7	7 per cent.	70.00
Attendance to horse, two hours	1.00	Every day	365.00
Investment on outfit, $200	.03 6-7	7 per cent.	14.00
Depreciation	.05½	10 per cent.	20.00
	$1.93		$701.90

No charges for insurance of horse, sickness and loss of time on that account, which may means loss of man's time, too, or even veterinary surgeon's, medicine, etc., accidents or other items.

He then took up the question of cost of a car, without considering the greater efficiency procured, such as ground covered, number of hours that could be charged to a customer, and money received. He said that the public were resenting having to pay for time not spent on a job, and so on. But he did boost up the idea which people would have of one who went to and fro from work in a motor car or truck, etc. Here is how he figured car cost, provided I covered a distance of 20 miles per day, with gasoline at 20 cents, (this was some years ago), 6 days a week, and I told him I only worked 5½ days per week, but he said he wanted to play safe and allow for everything that might come up.

He stated that in actual fact, and from figures taken, that his particular car or small ½-ton truck would cost a total of a dollar a day for upkeep, 300 working days a year, but that if for the sake of playing safe he allowed 350 working days, $350.00 would cover a 20 mile or 7,000 miles a year on $1.00 per day, including gasoline.

He then pointed out the saving of at least 1½ hours per day, that ½ an hour spent on a small truck would suffice as against 2 hours for horse attendance. He then pointed out that while I was only charging the horse attendance at 50 cents, I would likely charge the customer 75 cents, which I said I would. Therefore I would make $1.13 for the 1½ hours saved, and without going into minor details, splitting hairs as it were, his figures worked out as shown in Table II.

It must be remembered that these figures and arguments were used when our one-man business had been in existence two or three years. To-day these figures would be somewhat different. But as our friend from whom we got this information has had a truck now for two years, he was willing to admit that he would not keep a horse and wagon outfit if someone gave it to him. We received just such assurance from many owners of trucks and referred to same in our last issue. It must also be remembered that the man and firms whom we interviewed were conducting plumbing and heating establishments, so that the information procured and given to our readers should be of special value. The only way by which success may be attained in the sanitary and heating business, no matter what size the business, is to bear in mind that time is our most valuable asset, and any method adopted that will turn time into money cannot be other than commendable.

St. Thomas Gas Supply.—"It will relieve the minds of a great many startled gas users," says a St. Thomas paper, "to learn that, while last week's test of the city product was below Government requirements by some 12 points, the test taken Saturday morning by the Government inspector showed the quality of the gas to be appreciably higher and considerably over the Government minimum. The highest value obtained Saturday was 572 B.T.U. and the lowest, 562 B.T.U., with an average of 567 B.T.U., making the gas supplied at present 47 points above the minimum of 520.

CONFIDENCE

(New England Hardware News)

If you think you are beaten, you are;
If you think you dare not, you don't;
If you'd like to win, but you think you can't,
It's almost a cinch you won't.

If you think you're lost, you're lost;
For out of the world we find
Success begins with a fellow's will;
It's all in the state of mind.

If you think you're outclassed, you are,
You've got to think high to rise;
You've got to be sure of yourself before
You can ever win a prize.

Life's battles don't always go
To the strongest or fastest man;
But soon or late the man who wins
Is the man who thinks he can.

EXTERNAL PURIFICATION OF WATER

It is more scientific to purify the water before it enters the boiler than it is to follow the commoner plan of introducing it, with all its dissolved solids, and treating it after it is inside of the boiler. External purification is therefore strongly favored by modern engineers, whenever the conditions warrant it, and a number of effective forms of apparatus for purifying boiler feed water are on the market.

The photograph shows the members of the Toronto Warm Air Furnace Dealers Association assembled at their first annual banquet. They had as their guests for the evening the manufacturing of warm air furnaces. The members of the association are working towards having a practical heating bylaw put into effect.

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MR. EDWIN NEWSOME, for the past six years associated with THE SANITARY ENGINEER, PLUMBER & STEAMFITTER OF CANADA, latterly as manager and editor, has severed his connection with the paper. Mr. Newsome has helped materially in placing the paper on its present high plane, and we will continue producing a paper which will maintain the confidence of the many subscribers in various parts of Canada, and in accordance with our policy we will endeavor to make each issue better than the preceding issue.

Mr. Newsome has our best wishes for success in his new field of endeavor.

GETTING RIGHT WITH THE WORKERS

IN Hamilton recently, a small and informal gathering of local industrial leaders and representatives of organized labor was held which promises to spread a significant influence throughout Canada in establishing more intelligent relations between capital and labor and offsetting the Bolsheviki tendencies which are so menacingly at work in this period of unrest and readjustment. The manufacturers and the labor leaders took dinner together and then in a practical way started in to discuss the industrial situation as between employee and employer. It was after midnight when the gathering broke up. The executives put their cards on the table frankly and the representatives of the workers were told in a straightforward way of what was being done and had been done in their interests. The results were most gratifying.

Largely as the outcome of this meeting, an organization is now being worked out by the Canadian Manufacturers' Association to bring about better relations between workers and their employers throughout Canada. A committee is being appointed from each of the eight branches of the Association to meet with representatives of the labor element for a free and frank discussion of industrial problems. These committees will work with a central committee for all Canada, thus completing a national organization. Further than this, manufacturers are individually urged to take up in a direct way their problems with their own employees.

If this idea of intimate relations between the manufacturers and their employees can be carried out in a broad way much will be accomplished to solve the greatest problem which industry has to face to-day. Tariffs and readjusting prices are in themselves questions which are difficult of solution, but they are tangible in character as compared with that unknown quantity which may be termed "social unrest."

NEW EDITORIAL FEATURES

COMMENCING with the next issue, the SANITARY ENGINEER will contain several new editorial features. Arrangements are now under way, and practically completed, for an editorial service that will include many features not previously included in the editorial department of this paper. A more complete announcement, giving details, will appear in the April 1 issue.

WILL WAGES REMAIN UP?

THERE appear to be a great many contradictory views regarding the future of wages and prices. Some weeks ago the feeling was quite general in most quarters that within the next few months there would be reductions in wages to such an extent it would be possible to reduce the prices on many manufactured products in which labor cost is one of the biggest factors.

During the past couple of weeks there is less disposition to encourage the view that there will be a reduction in wages in the immediate future. The *American Metal Market* in referring to this condition states that the remarkably small amount of unemployment occurring with the apparent dullness in nearly all industries is being recognized as an evidence that labor is not likely to be as plentiful as was expected. The demobilization proceeds slower, from the standpoint of the men who are being taken into industry. This is not surprising in view of the experience after the civil war. The men were near home then, yet they were absorbed with practically no disturbance. Increased attention is being paid to the movement and prospective move-

ment of the foreign born. It is well known that a great many of the foreign born intend to return to the land of their birth, and even if many who now intend to do so do not carry out the intention there will be a great migration nevertheless. It would be strange, indeed, if this did not occur. If it is not a great boon to the people for whom independent republics are being set up in Europe, why is it being done? If it is a great benefit to those peoples, why would not the new condition draw some men from this country?

In the circumstances it is easy to see that possibly there will be no trend at all for wage rates for common labor to decrease.

DISHONESTY IN BUSINESS

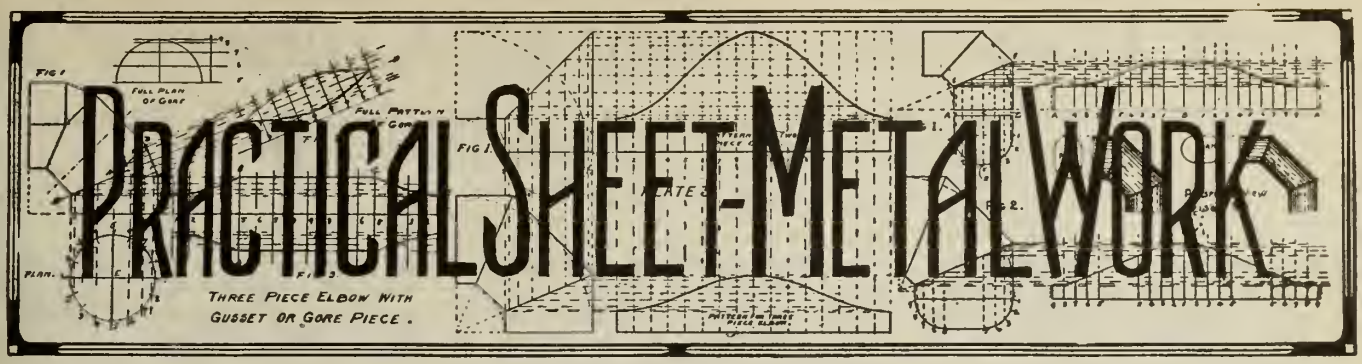
THE whole fabric of modern business and industry is based on confidence. Any one, be he retailer, wholesaler, or manufacturer, who breaks faith with another, takes a slash at business in general. There are those who break their contracts when prices decline, and feel safe in the knowledge that it would cost too much to litigate, and the judgment would not cover all the loss of money, and none of the loss of time. Sometimes, a real business man does get disgusted, and in spite of his loss, he gives the offender a lesson on the ethics of business for the benefit of the country in general. There are, however, large numbers of the small calibre business man who manage to stay in business, sit tight while markets rise, and welsh when prices decline—usually escaping the penalty, probably because the game is not worth the ammunition.

It has been known for a carload of canned fish from the Pacific Coast, packed and labelled to the order of an Atlantic house, to be cancelled by wire a few days before date of shipment because the market has declined, and the shipper, with a carload of canned fish on his hands, was told, "He could use his own judgment about shipping, but the stock would be refused on inspection." What powers of clairvoyance! It has been known that a carload of Eastern jams, has been accepted en route only on greatly modified terms by the consignee in the West, which simply meant that goods were received under terms and at prices which, had the shipper known, the goods would never have been shipped. It has been known that cars of fresh fruit from the fertile valley of the Fraser have been refused on arrival on the Prairie—except they were delivered to the "Buyer" on consignment only, and the wily shipper, instead of "falling," took the night train, and reached the Prairie point to find the cars well iced and unopened.

There is a serious lack of the fundamental basic principles of honesty evident among some engaged in business, and it is the duty of every business man to stamp out the unprincipled, unethical member wherever his presence is discovered. Make it unprofitable to be morally as well as legally dishonest.

Current Events in Photograph

The photo shows one of the British "K" class submarines, the largest underseas boats in the world. This one, which is 350 feet long, ran ashore in a fog on the coast of Lancashire. It was refloated and proceeded on its way undamaged next day. This type of boat, it will be noticed, carries a four-inch gun fore and aft as well as an anti-aircraft gun amidships.



BY THOMAS STANSFIELD

IN the last issue we dealt with the inside round piece in connection with an extension chimney top, the accompanying plate shows the top part of the chimney cap, and how to develop the pattern for it.

A full elevation of the whole extension is shown in Fig. 1, along with plan of cap. First draw the tap as shown at AA, BB, CC, DD, and EE, this to be same size as the octagon piece shown in plate 40 which appeared in last issue. Next draw the plan, with line intersecting any two sections and the centre E. Now draw a vertical line as in Fig. 2, A, D, E, B, and with compasses measure off the various distances between line E in plan and points AB, AB, DE, DE to the vertical line in Fig. 2. To procure the true length of material required for the pattern, transfer the measurements from one side of the elevation B to E, E to D and D to A, to the vertical line in Fig. 2, by joining the various points of intersection. The pattern for one side of the octagon piece is now complete. This is all that will be needed, as all the eight sides are the same. Allow as shown a small piece of sheet metal for joints which is generally riveted.

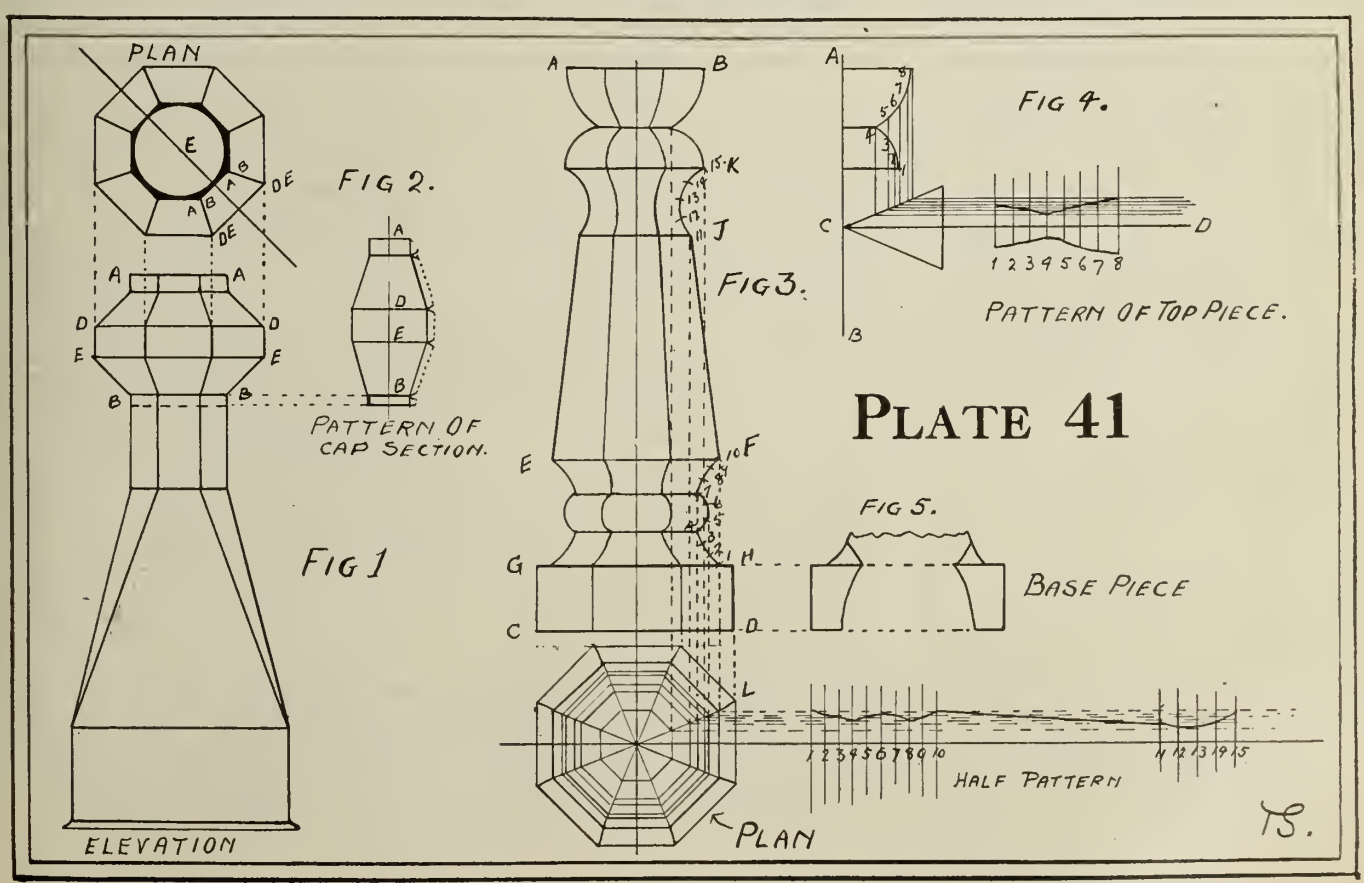
Fig 3 shows the plan and elevation of an octagon stand or newel post. While there are not very many of such articles made these days, the developing of the patterns will prove very interesting practice. First draw the outline shape as shown at A, B, C, D, E, F, next the plan, dividing same with eight equal parts from the centre. The outer corners will show the student how to arrive at the proper way to design the proportions on the post equally, by drawing lines from the moulded parts to the mitre lines on the plan. The base CD, is merely an octagon box with hole in top of same, which will, when complete, be covered over by the post. Fig. 5 shows shape of braces that may be fitted inside the base piece to stiffen it.

Now draw a stretchout line in line with centre of plan and measure the side of post from points H, F. J, K, as follows H, 1, 2, 3, 4, 5 and so on to 10, then the true length between F and J in one measurement. Next from J to K into smaller parts, transfer these measurements to the stretchout line.

From these points on side of elevation draw a number of vertical dotted lines down to the mitre line L, and again from points developed on mitre line L draw a number of lines parallel with the stretchout line.

After drawing vertical lines across these parallel lines at the various points 1, 2, 3, 4, etc., till 15 is reached, only one more operation is required, viz., that of

Continued on page 31



Heat Loss and How to Conserve It

Definition of the Term "Heat"—How Heat is Lost—How Heat Can Be Conserved —Where Heat Can Be Saved—Various Heat Insulators Described

By One Of Us

THE dictionary tries to define heat in a few words, while on the other hand, hundreds of scientific books have been published, the authors of which have made a special study of the subject.

But, for all practical purposes, it can be stated and taken for granted that heat is, in some form, the product of combustion of fuel, friction, or is created by the sun's rays.

It would be too long a story to begin, or even try to begin to explain the above definitions. But, as before stated, those simple solutions as to what heat is, are sufficient as an explanation to the average reader.

There is, however, one form of heat which most of our readers are particularly interested in and familiar with; that is the first named, viz.: That form of heat which is generated by combustion of some form of fuel. Heat is vital to every industry and to every living being, and our fuel statisticians are warning us that our fuel is becoming scarcer every day, though at the rate we are wasting it we do not appear to fear any lack or shortage of fuel.

We have used coal in a most extravagant manner, and now, with oil becoming popular, we are wasting that too. We do not waste the latter to as great an extent per B.T.U. as we do the former, because, with oil, certain mechanical appliances that can be adjusted and regulated, are more under control than is the consuming of coal, this requiring a more perfect combustion of all the gases that are released by subjecting coal to heat.

But in both cases heat units are being wantonly wasted, on the one hand by the careless way in which boilers and steam generating plants are installed, and on the other hand by the lack of insulation of piping and vessels carrying either hot water or steam. By way of illustrating, here follows a very simple experience which the writer had some years ago.

A certain householder complained of a kitchen range giving poor service; she could not bake with the oven. A range boiler stood near the kitchen door and it was connected to the waterfront in the range. The writer put two ply of air-cell asbestos and canvas cover round the boiler, and the range oven at once worked well. That is a very simple and small matter to mention. On another occasion it was a case of covering the range boiler in the same way, which resulted in a direct saving of $1.00 per month on the gas bill. Gas was at that time $1.00 per thousand cubic feet net.

The Measurement of Heat

When we refer to the heat loss in a building, we really mean that when we heat a building to, say, 70 degrees, the temperature outside being at zero, a certain heat loss will result. It is just a matter of enclosing a certain cubic content of air at an outside temperature, and, by radiation, raising the air to 70 degrees. And to do so we must, say, heat a radiator by steam or water, taking from the contents of the radiator those B. T. units generated at the boiler or furnace.

We know that if the outer surface of a receptacle is hot, heat is escaping; that is, technically speaking, defined as heat loss. But, of course, to accurately measure such heat loss would mean the utilizing of special and expensive appliances. Though in a few words it may be stated that when steam is conveyed to a radiator at, say, 2 lbs. pressure, and water of condensation is measured by either weight of cubic measurement, and the temperature of the condensed water is taken, the difference in B. T. U. in the water and the B. T. U.s of steam delivered would show what heat loss had resulted.

The standard of heat measurement is the British Thermal Unit, which corresponds roughly with the second of time, the ounce by weight, or the inch in length, viz.: It is a unit of measurement. Steam is water gas, or water turned to vapor. One cubic inch of water will make one cubic foot of atmospheric steam, so it will be noted that water expands to 1,728 times its volume when turned to atmospheric steam.

One B.T.U. is defined as that amount of heat required to raise one pound of water one degree Fahrenheit. There are about 13,000 useful B.T.U.'s in one pound of coal, and one pound of coal will approximately convert 7 to 10 lbs. of water into atmospheric steam, depending, of course, upon the character and efficiency of the boiler, the way it is fired and the combustion of the coal.

Radiation, Conduction and Convection

The average heating engineer is apt to define radiation as so much metal or "radiators." As a matter of fact, such is not the case. Radiation is rather "the action of passing of heat from a solid body to the atmosphere." Conduction, or contact, carries the heat of a pipe (radiator) boiler from an interior to an exterior. Convection, or circulation, creates that motion which spreads the heat through the surrounding atmosphere, and all three terms really mean one and the same thing—heat, loss or leakage—and all these three forms of heat loss are going on unless some means is followed by which the heat in any piping, boiler, etc., is conserved by covering up in some way or other.

Poor and Good Conductors

In China and Japan it is stated that some buildings are heated by having the heat pass through ducts similar to chimneys, under the floors, and that the warmed floors are depended upon to heat the building. It would not be practical to use metal floors, because the heat loss would be so great that the floors could not be walked upon, so stone or mud-covered floors are used. The more solid a material is (homogeneous, metallic, etc.) the more rapidly it loses heat, and therefore metal is the most rapid conductor of heat. Even some metals are better conductors than others, the denser the better, viz., aluminum, lead, copper, tin, brass sheet; next in turn, cast brass; and next, cast iron. Rolled iron or steel would be a greater conductor than cast, simply because of the fact that cast iron is more porous. But the reason why the cast iron radiator is the most popular is because there are other points to consider, such as manufacturing, durability, construction, longevity, etc., etc.

Conservation of Heat

Now, as to the conservation of heat, there are a score and one ways by which heat can be saved, and should be, not taking into account the score and one ways by which steam or heat is first generated. This article really is mostly concerning the saving of heat after it has been generated. Most heat wastes take place in portions of a building which do not require heat, steam mains, risers, etc., and even though, say, a basement requires heating, it would be far better and much more economical in the end to cover all mains and furnish radiation for the heating. Many steam heating systems have been made less efficient because of the fact that the steam mains were used as radiation, and the steam was wet as a result of condensation forming in those mains, while drier steam would have resulted in a greater heating efficiency in the whole system.

There are quite a number of pipe coverings on the market, all of which have their merits and demerits, but when maximum efficiency from a heating system is required the best pipe coverings are none too good for the purpose.

However, the true secret of pipe coverings is the number of air-tight confined cells of which the pipe covering is

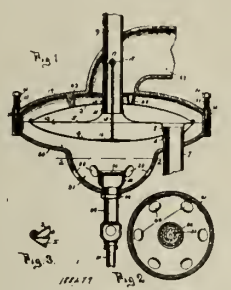
Continued on page 30

New Canadian Patents

No. 188,479

John B. Dudley, Detroit, Michigan, U.S.A., 28th January, 1919; 6 years. Filed 21st October, 1918. Receipt No. 300,629.

Claim.—1. In a water heater, the combination of a water chamber consisting of upper and lower outwardly convex heads and a substantially flat horizontal



188,479. Water Heater.

diaphragm between them, a pipe connecting into the space above the diaphragm to supply water thereto, said diaphragm having a hole through which said water may pass to the space below it, a burner below the lower head, and a housing extending around the burner and then around te water chamber with its walls substantially parallel to the outer portion of the lower head and to the upper head to cause the burnt gases to flow in engagement with said surfaces of the water chamber.

7. In a water heater, a water chamber consisting of two circular heads convex away from each other, and a substantially flat diaphragm between them provided with an opening to permit the flow of water, a feed pipe passing through the lower head at one side of its center and connecting into the diaphragm, a discharge pipe passing through the center of the upper head and connecting into the diaphragm, and a burner below the center of the lower head and said discharge pipe.

11. In a water heater, a water chamber consisting of upper and lower heads, a diaphragm between them provided with a single opening to permit the flow of water, a single feed pipe connecting to said water chamber so as to supply water to the space above the diaphragm, said feed pipe and said opening in the diaphragm being spaced apart and near the edges of said diaphragm, a discharge pipe connecting into said water chamber below the diaphragm, and means to heat the lower head of the water chamber.

Claims allowed, 11.

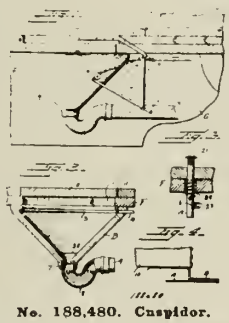
No. 188,480

William Dunnell, Detroit, Michigan, U.S.A., 28th January, 1919; 6 years. Filed 4th November, 1918. Receipt No. 301,088.

Claim.—1. A cuspidor, comprising a bowl, a waste pipe in communication with the lower portion of the bowl, a flush pipe arranged within the upper portion of the bowl and leading from a suitable source of water supply, a valve interposed in said flush pipe, a movable lid normally closing the upper face of the bowl, a member operatively connected with the lid for swinging the lid into open position, and a connection between said last-named member and the valve whereby the valve is moved into open position when said member is operated to move the lid into open position.

3. In combination, a bowl, a waste pipe in communication with the bowl, a hingedly supported lid normally closing the bowl, a rearwardly directed arm carried by the lid, an endwise movable rod, a lever supported for swinging movement, an end portion of the rod being pivotally engaged with said lever, and a flexible connection between said lever and the arm whereby the lid is moved in one direction upon movement of the rod in one direction.

4. In combination, a bowl, a waste pipe in communication with the bowl, a hingedly supported lid normally closing the bowl, a rearwardly directed arm car-



No. 188,480. Cuspidor.

ried by the lid, an endwise movable rod, a lever supported for swinging movement, an end portion of the rod being pivotally engaged with said lever, a flexible connection between said lever and the arm whereby the lid is moved in one direction upon movement of the rod in one direction, and a guide pulley adjacent the lever and over which the flexible member passes.

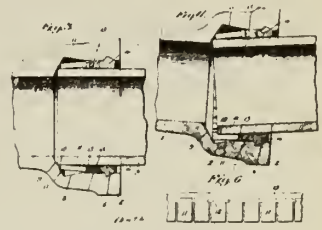
Claims allowed, 6.

No. 188,494.

James R. McVane, Birmingham, Alabama, U.S.A., 28th January, 1919; 6 years. Filed 25th October, 1918. Receipt No. 300,781.

Claim.—1. A prepared self-tightening joint suitable for pipe, comprising bell and spigot portions with a series of filler blocks constituting a backing for the sealing material, the bell having a basic portion against which the blocks abut, fibrous packing material lodged against the backing, and sealing lead at the mouth end of the joint in compacting relation to the fibrous packing material.

4. A joint for bell and spigot pipe comprising filling means located at the basic end of the bell and constituting an anvil, fibrous packing material engaging the anvil, and lead packing between the fibrous packing means and the mouth of the bell in compacting relation to the fibrous packing means.



No. 188,494. Pipe Joint.

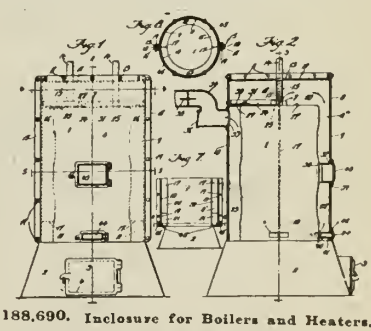
6. A joint for bell and spigot pipe, comprising filling means constituting an anvil, fibrous packing engaging the anvil, and lead packing in compacted relation to the fibrous packing.

Claims allowed, 6.

No. 188,690.

Harry C. Streeper, Bristol, Pennsylvania, U.S.A., 11th February, 1919; 6 years. Filed 28th June, 1918. Receipt No. 296,714.

Claim.—1. The combination of a heater having an outlet opening for the products of combustion, a jacket surrounding said heater and spaced therefrom to provide a chamber, said jacket being made in plurality of sections and having outwardly projecting flanges, baffle plates having outer edge portions secured between said flanges and having their inner portions extending across said chamber and into engagement with said heater, said latter portions of the baffle plate being interrupted in their length at opposite ends to divide the chamber into a number of compartments and to provide a passageway forming communication between the compartments at a position remote from said



188,690. Inclosure for Boilers and Heaters.

outlet opening of the heater, another baffle connecting said baffle plates and forming a closure for certain of said compartments between said outlet opening of the heater and said remote passageway, said jacket having an outlet opening adjacent said second baffle, substantially as described.

(Continued on page 30)

WISCONSIN APPRENTICESHIP

(Continued from page 14)

the boy becoming sick or taking vacations, etc.

Schedule of processes to be worked:

"During the first three years of his apprenticeship the apprentice shall receive instructions and experience in all branches of plumbing necessary to develop a thorough, practical, and skilled mechanic versed in theory and practice of installing hot and cold water supply, drainage and venting and plumbing appurtenances, in accordance with the State Plumbing Code and local ordinances. The apprentice shall perform such other duties as are customary in connection with plumbing apprenticeship." Where vocational schools are established he shall attend school five hours per week, or its equivalent, to receive such instruction as may be determined in accordance with Section 2377 of the Statutes.

"During the fourth and fifth years the apprentice shall be given in addition to experience and instruction as provided for the first three years, opportunity to make plumbing installations under the supervision of a journeyman or master plumber such as may enable him to qualify at the end of his apprenticeship as a skilled mechanic in the art of plumbing."

This schedule of processes has been the result of much thought and study. Obviously, a man cannot be a plumber who knows only shop mechanics. But a modern plumber must, in addition to being a skilled mechanic, know certain theory with reference to hygiene, materials, elements of citizenship, etc. This the vocational school provision is meant to cover. It is, furthermore, well-known that to be a skilled-mechanic the apprentice must have an opportunity to use the tools of the trade; so, for that reason, there is an express statement that during the fourth and fifth years the boy shall be given such opportunity as will enable him to acquire some independence of workmanship at the expiration of his term.

Compensation to be paid—the apprentice shall receive in wages:

"Minimum rate of wages:

First six months	$.....	per week
Second six months	$.....	"
Third six months	$.....	"
Fourth six months	$.....	"
Fifth six month	$.....	"
Sixth six months	$.....	"
Seventh six months	$.....	"
Eighth six months	$.....	"
Ninth six months	$.....	"
Tenth six months	$.....	"

Suggestion: Upon receipt of his state license the apprentice shall be given a kit of plumber's tools by the employer."

Rates of wages are to be adjusted by the parties to the contract. It is suggested that in all cases the wages be uniform in the particular community if possible.

Special provisions:

"Both parties to this indenture agree to cooperate with each other, the apprenticeship school and the Industrial Commission of Wisconsin in carrying into effect the intent and purposes of this indenture. At the satisfactory completion of the apprenticeship the apprentice shall receive a diploma issued under the seal of the Industrial Commission and the Board of Health of the State of Wisconsin."

The Industrial Commission is granted by mutual agreement of the parties to this contract, the right to change any rules of this indenture if such changes are deemed by the Commission to be in the public interest.

RULES OF ADMINISTRATION

"1. Forms of contract which shall contain the content Exhibit 'A' shall be furnished by the Industrial Commission.

"2. Contracts should be received in the office of the Industrial Commission at Madison, during the first thirty days of the employment of the apprentice, it being understood that the contract is not binding until after the expiration of three months from date beginning apprenticeship.

"3. Apprentices shall be informed by the school authorities on advice from the Industrial Commission as to when and where they shall attend school for academic instruction as agreed under Exhibit 'A' of the contract.

"4. Apprentices while attending school are still employed and paid by the employer, and they must show the same application to work as if in the shop.

"5. Employers shall report immediately any apprentice whom they shall know to have unlawfully left his employer.

"6. Employers shall not discharge a boy without good cause and not then until such matter has been considered by the commission or a deputy thereof, and both sides of the case recorded, but may suspend an apprentice for sufficient cause pending a hearing. Cases in controversy to be adjudicated by the Industrial Commission through advice of the Wisconsin Plumbers' Apprenticeship Board.

"7. At the end of three years the apprentice may make application for an examination for a license according to law and rules and regulations presented by the State Board of Health, but this shall in no sense affect the terms of the apprenticeship indenture.

"8. Under the law apprentices already employed are required to execute the apprenticeship indenture but shall be duly accredited for all time they have been employed as such.

"9. Under the law apprenticeship indentures already accepted by the Industrial Commission shall not be affected by the adoption of Exhibit 'A' of the plumbers' apprenticeship contract.

"10. Present arrangements which have not been legally executed shall be changed so as to comply with the law and the apprenticeship rules."

Those administrative rules have been determined to assist in an equitable administration of the system, and, being rules, can necessarily be changed or modified according to the exigencies of experience, provided, of course, substantial consent is obtained from the trade.

Technical Education Outside of Shop

It is not the purpose of the apprenticeship plan herein outlined to prevent an apprentice from terminating his contract in favor of a technical education outside the shop. When a young man under indenture desires to pursue a technical course in a trade or technical school, he may make arrangements with the Industrial Commission. In such case his contract with the employer may be legally terminated. Or he may desire to enter a school of higher education, in which event he may apply to the Industrial Commission for advice, and suitable arrangements will be made.

Requirements for Journeymanship

The following outline suggests the subjects with which the apprentice in the plumbing trade should become familiar before he can perform efficiently the work of a journeyman plumber and expect to receive a diploma and license from the state. These requirements do not represent the highest possible attainments for the plumber, but strike a fair level to which a plumber must rise in order to be called a skilled mechanic.

I. Materials and Tools of the Trade, and Principal Essentials to be Learned

The apprentice should familiarize himself with the principal materials of the trade and other essentials involved in plumbing work, especially the following:

(a) Tools—plumber's kit and shop tools.
(b) Cast iron pipe and fittings.
(c) Wrought iron and commercial steel pipe and fittings.
(d) Vitrified clay pipe and fittings.
(e) Lead pipe, sheet lead, and solder.
(f) Copper, brass and kindred metals.
(g) Galvanized iron materials.
(h) Tile, marble, slate, cements, and composition materials.
(i) Plumbing fixtures—kind, design, materials and construction of.
(j) Faucets, valves, tanks various makes.
(k) Traps—kind, design, depth of seal, materials and construction of.
(l) Pumps, syphons, catch-basins, and ejectors.
(m) Domestic hot water heating appliances.
(n) Miscellaneous materials.
(o) State Plumbing Code, trade publications, books on theory and practice of plumbing recommended by the Plumbing Division, and standard plumbing supply catalogues.

II. Trade Terms

A mechanic or apprentice should acquaint himself with the meaning of the following terms used in the trade. Many of these are explained in the Wisconsin Plumbing Code, issued by the Wisconsin State Board of Health:

Neatness	Stack
Approved	Grade
Flux	Horizontal and vertical pipes
Location	Hanger
Air	Support
Light	Background
Ventilation	Centre
House sewer and main drain	Clean-out
House drain	Terminal
Soil pipe	Catch-basin
Waste pipe	Capacity
Main soil or waste vent	Diameters
Vent pipe	Sketch
Back vent pipe	"Dont's for plumbers
Unit vent	Care
Circuit vent	Method
Trap	Connections
Depth of trap seal	Change or direction
Deep seal, reseal'ing trap	"Prohibited"—"permitted"
Deep seal	Overflows
Subsoil drain	Radius of bend

III. Tools of the Trade

The apprentice must acquaint himself with the following list of tools of the trade and must learn their use:

A. Plumber's Kit.

Conductors, or roof leaders	Sewer air ("gas")
Back flow	Circulation
Dead end	Fresh air
Private sewer	Substantial
Sanitary sewer	Construction
Septic or biological tank	Design
Cesspool	Domestic hot water
Roughing in	Safe water supply
Wiping a joint	Effluent
Sanitary plumbing	Disposal unit, dry well
Private dwelling	Inspection
Alignment	Defective
Terminal	Testing
Public building	Syphonage
Place of employment	Good workmanship
Private residence	Service
	Law, ordinance, rule, order, code

B. Shop Tools.

Hammer	Rasp
Wood chisel	Dresser
Cold chisel	Bending pin
Compass saw	Copper soldering bolt
Auger	Wiping clotbs
Rule	Springs, 1¼" to 2"
Square	Tap borer
Plumb bob	Shave hook
Level (spirit)	Hack saw
Drills and reamers	Plumber's furnace, pot and ladle
Plier	
Compass	Pot hook
Screw driver	Caulking tools
Monkey wrench	Snip shears
File	Brick and stone drill
Turn pin	Joint runners
Drift plug	

C. The apprentice should learn the use and arrangement of a tool chest, how to sharpen the tools, and the necessity for maintaining them in good condition.

IV. Design of Installation

The apprentice must obtain knowledge sufficient to design plumbing installations, and in that connection must learn:

Cutters	Reamer
Stock	Pipe bending tools
Die	Pipe wrench
Vise	Chain tong

(a) Proper use of materials.
(b) Sizes, grades, changes in direction and alignment of piping.
(c) Arrangement of drain, soil, waste, vent, water piping, and appliances in connection therewith.
(d) Neatness of design, efficiency of service, and durability of construction.
(e) Location of fixtures with reference to light, air, convenience, and proper sanitation.

Continued on page 31

Market Conditions and Tendencies

Statements Regarding Supplies and Trend of Prices

THE MARKETS AT A GLANCE

DECLINES have been provided for in new quotations issued this week on range boilers. The present scale of prices shows a general reduction approximating 12½ per cent., the contributing factor very largely being lower priced steel sheets now available.

Black steel sheets have come in for a further readjustment this week, and jobbers indicate that they are down to rock bottom in relation to their costs to-day. There is a feeling prevalent in the trade that lower prices should prevail on sheets, and the first of April, ending as it does the first quarter of the year, is looked forward to as the date when mills may institute a further decline in prices. Should a lower price schedule obtain it would seem as though many jobs now being held back will be undertaken and business resumed along more stable lines. Galvanized sheets have also declined since last issue, 25c per 100 pounds being lopped off the price in some quarters.

Copper, tin and lead have been halted in their downward move; in fact all ingot metals seem to have pretty well reached the bottom for the present. There is quite active buying of copper at prices prevailing to-day, and lead has firmed up, with spelter stronger in sympathy. The next two or three months are active ones for the various metals, and it does not seem as though any further appreciable change downward is a prospect before summer.

What may develop at meeting of iron and steel interests in United States now is still somewhat uncertain, but that a lower basis will be arrived at is the opinion generally held. Should this develop, the effect on soil pipe and fittings, wrought pipe, boiler tubes and kindred lines is not hard to determine. Another week or two should clear up the situation materially.

TORONTO, March 13.—Further readjustments have been made in black steel sheets this week and a decline of 25c in galvanized sheets has also been made. Range boilers have sagged about 12½c per cent. and a somewhat weaker tone is reported in soil pipe and fittings, though no price change is recorded as yet. Ingot metals seem to be somewhat near the bottom, with copper, tin and lead showing some slight reaction.

Decline in Range Boilers of About 12½%

RANGE BOILERS.—The weaker tendency of the market, as outlined in SANITARY ENGINEER the last two issues, has developed in lower prices being named on range boilers this week. These follow on the heels of substantial reductions made in sheets and indications are that the basis arrived at will prove much more satisfactory from a consuming standpoint. New prices on the standard boilers are given as follows: 12 gal. and under, $9.50; 20 gal. and under. $10.50; under 30 gal., $11.50; 30 gal., $12.25; 35 gal., $15.00; 40 gal., $18.00; 52 gal., $24.00; 66 gal., $33.00; 82 gal., $40.00; 101 gal., $50.00; 120 gal., $65.00; extra heavy boilers quoted for the 30 gal., $14.50; 35 gal., $17.00; 40 gal., $20.00; 52 gal., $28.00; 66 gal., $38.00; 82 gal. $47.00; 100 gal., $58.00; 120 gal., $75.00; 144 gal., $90.00; 168 gal., $100.00; 192 gal., $110.00.

Range Boilers	Standard	Extra Heavy
30-gallon	$12 25	$14 50
35-gallon	15 00	17 00
40-gallon	18 00	20 00
52-gallon	24 00	28 00
66-gallon	33 00	38 00
82-gallon	40 00	47 00
100-gallon	50 00	58 00

Heating Coils Under Revision Too

HEATING COILS. — Quotations on heating coils have been revised; also prices being issued this week. The charge on these is extra to that named on the range boilers. The following quotations are now effective: 30 gal. and under, $12.00; 35 gal., $14.00; 40 gal., $16.00; 52 gal., $20.00; 66 gal., $25.00; 82 gal., $28.00; 100 gal., $31.00; 120 gal., $35.00; 144 gal., $40.00; 168 gal., $45.00; 192 gal., $50.00.

Enamelware Shows Steady Outlook

ENAMELWARE—There is little buying interest manifest in enamelware at the present time, and new developments in the markets are lacking. The trade, however, are satisfied with the outlook and feel that prospects encourage optimism.

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Basins, flat back, 14 x 15 in.	6 00
Do., corner, 15 in.	5 95
Sinks, roll rim, 18 x 30 in.	15 05
Closets, oak tank and seat	27 00
Do., enamel iron or white vitro tank	29 00

Soil Pipe, Fittings Hold Unchanged

SOIL PIPE, FITTINGS.—No quotable change in the market situation on soil pipe or fittings is yet apparent, though the feeling seems to be generally held that lower price levels are about due and may develop before the end of the present month. Business is rather quiet, though there are some fair sized orders being handled.

SOIL PIPE AND FITTINGS	
Medium and extra heavy soil pipe, 2 in. to 6 in.	15%
Medium and extra heavy fittings, 2 in. to 6 in.	25%
8 in. soil pipe and fittings	Net list

C. I. PIPE FITTINGS	
Cast iron fittings	12½%
Plugs	22%
Bushings	28%
Unions, standard	35%
Dart unions, ¼-inch to 2-inch	20%
Do., 2½-inch and larger	12%
Nipples, up to 4-inch	45%
Do., 4½-inch and larger	40%
Do., running thread 4-in. and under	25%
Couplings, 4-in. and under	35%
Do., 4½ in. and larger	15%

MALLEABLE FITTINGS	Black	Galv'd
Malleable Fittings, Class A, lb.	0 53	0 66
Do., Class B, lb. net	0 24	0 33
Do., Class C, lb. net	0 16	0 24

Situation in Valves Remains Steady

VALVES.—The situation in regard to valves is without appreciable change. Quotations still hold at unchanged figures, and whereas a fairly good business is being handled, this could be increased and is reasonably expected to improve when things open up a little more with the coming of Spring.

	Discount off list
Compression work, standard	45
High grade	41
Fuller work, standard	43
High grade	36
Basin cocks, No. 0 standard	38
Nos. 1 and 2	38
Bath cocks	48
Flatway stop and waste cock, standard	45
High Grade	45
Roundway stop and waste cocks, standard	45
High Grade	45

Brass steam cocks, standard, add 10%.

Globe, angle and check valves, standard. Net	
Do., removable disc	Add 5%
Radiator valves, standard	10
Do., removable disc	Net List
Basin Cocks—	
No. 0 and 1, Fuller pattern	43
Globe, angle and check valves, standard, medium pressure	10
Radiator valves, standard med. pressure.	30
Radiator valves, removable seat, medium pressure	25

Wrought Pipe Holding Steadily

WROUGHT PIPE.—There have been no new developments in the market on wrought pipe. What may develop as a result of the present conference of steel men in the United States seems just a little uncertain, but best informed men in the trade look for reductions in steel and iron prices by April 1, and that pipe may fall in line seems quite probable. Prices for the week hold at figures shown in panel herewith:

WROUGHT PIPE
Price List No. 38—January 6, 1919.
Standard Buttweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
⅛ in.	$6 00	$ 8 00	$	$ ....
¼ in.	4 68	6 81	5 28	7 41
⅜ in.	4 68	6 81	5 28	7 41
½ in.	6 21	7 78	7 06	8 63
¾ in.	7 82	9 95	8 97	11 10
1 in.	11 56	14 71	13 26	16 41
1¼ in.	15 64	19 90	17 94	22 20
1½ in.	18 70	23 76	21 45	26 54
2 in.	25 16	32 01	28 86	35 20
2½ in.	40 37	51 19	.....	.....
3 in.	52 79	66 94	.....	.....
3½ in.	67 16	84 18	.....	.....
4 in.	79 57	99 74	.....	.....

	Standard Lapweld Blk.	Standard Lapweld Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Steel			
	Per 100 feet			
2 in.	$28 86	$35 34	$32 56	$39 03
2½ in.	42 12	52 36	47 97	58 21
3 in.	55 08	68 47	62 73	76 12
3½ in.	69 00	86 94	78 20	96 14
4 in.	81 75	103 00	92 65	113 90
4½ in.	93 00	118 00	112 00	137 00
5 in.	108 00	137 00	130 00	159 00
6 in.	140 00	178 00	169 00	206 00
7 in.	183 00	232 00	219 00	268 00
8L in.	193 00	244 00	230 00	281 00
8 in.	222 00	281 00	265 00	324 00
9 in.	266 00	336 00	.....	.....
10L in.	246 00	312 00	294 00	360 00
10 in.	317 00	402 00	379 00	464 00

Terms, 2% 30 days, approved credit.
Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Cotton Waste Prices Down; Oakum Firm

WASTE, OAKUM.—New quotations on some lines of colored waste were omitted in listing changes in last issue. These are reproduced herewith, the present figures being lower than those formerly in effect. Quotations are: Fancy, 15½c per lb.; Lion, 14c; Standard, 12½c; Popular, 11c; Keen, 9½c. Cotton waste is now pretty well down to lower price levels, quotations being revised a couple of weeks ago on some lines. New prices on some of the other numbers, which are also lower, are shown herewith: White, XXX. 19c per pound; XX, 18c; X, 16½c; XC, 15c; Japanese, 14c; colored, No. 5, 15c per pound; No. 1, 13½c; No. 7, 12c; No. 1A, 10¾c; No. 1B, 9½c.

There has been no change in the situation on oakum though prices on marine oakum rule with a very firm undertone. Business is fair and outlook generally considered satisfactory.

	Per 100 lbs.
Best American	$21 00-$22 00
Clipper, spun	....- 21 00
Do., unspun	....- 10 50
Plumbers', spun	10 00- 10 50

Boiler Tubes Remain Unchanged

BOILER TUBES.—Boiler tubes are holding at lower figures established this week. Jobbers report sales as very good, and that they are now able to secure deliveries quite promptly from the mills. Whether boiler tubes will be affected by any changes made as a result of present meeting of steel interests is unknown, but they may well follow course of other materials. Range of quotations follows:

BOILER TUBES—	Per 100 feet Seamless	Lapweld
1 inch	$28 00	$.....
1¼ inch	32 00	.....
1½ inch	35 00	28 00
1¾ inch	35 00	28 00
2 inch	40 00	28 00
2¼ inch	43 00	30 00
2½ inch	45 00	35 00
3 inch	52 00	40 00
3¼ inch	.....	47 00
3½ inch	62 00	48 00
4 inch	70 00	60 00

Black Sheets Lower; Galvanized Down 25c

SHEETS, PLATES.—Revised prices are again shown this week in black sheets, and jobbers state they are positively down to rock bottom, when working on to-day's cost. A decline of 25c per 100 pounds has also been made in some quarters on galvanized sheets, bringing the base on 10¾ oz. to $8.25. There seems to be a desire on the part of the mills to get as close as possible to the point where buyers will confidently come into the market, knowing that they are safe in making extensive purchases.

There is a feeling in the market and in the trade generally that a cut is likely to come in steel prices. When? Perhaps on either side of April first. That, at least, is the opinion of one Toronto dealer whose guesses are seldom far off the mark. There seems to be a growing belief that prices of material are holding back considerable work that might otherwise be gone on with. Just how much more business would be booked at a lower steel price is, of course, problematical, but several of the dealers are quite certain that the coming of a lower figure would bring a lot of buying to the market.

There seems to be some danger that the reduction may not be made in such a manner as to preclude the danger of a price-cutting campaign. Were this to start it might be difficult to put a peg in and stop the movement, and prices might easily be flattened to below costs The general belief is that a new schedule will become operative about the first of April, and the trade generally will be glad to witness a return to a basis where they can get out after business without the possibility of having their feet cut out from under them. Quotations being named to the trade follow:

BLACK SHEETS—	Per 100 lbs.	
10 gauge	$5 50	$6 00
12 gauge	5 55	6 05
14 gauge	5 60	6 10
16 gauge	5 70	6 20
18-20 gauge	....	6 30
22-24 gauge	....	6 35
26 gauge	....	6 40
28 gauge	....	6 50
3-16 inch plate	....	5 75
¼-inch boiler plate	....	5 50

Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

GALVANIZED SHEETS—		
10¾ oz.	$8 25	$8 50
U.S. 28	7 95	8 20
U.S. 26	7 65	7 90
22 and 24	7 50	7 75
18 and 20	7 35	7 60
16	7 20	7 45

Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

Lead Products, Solder Show Firmer Feeling

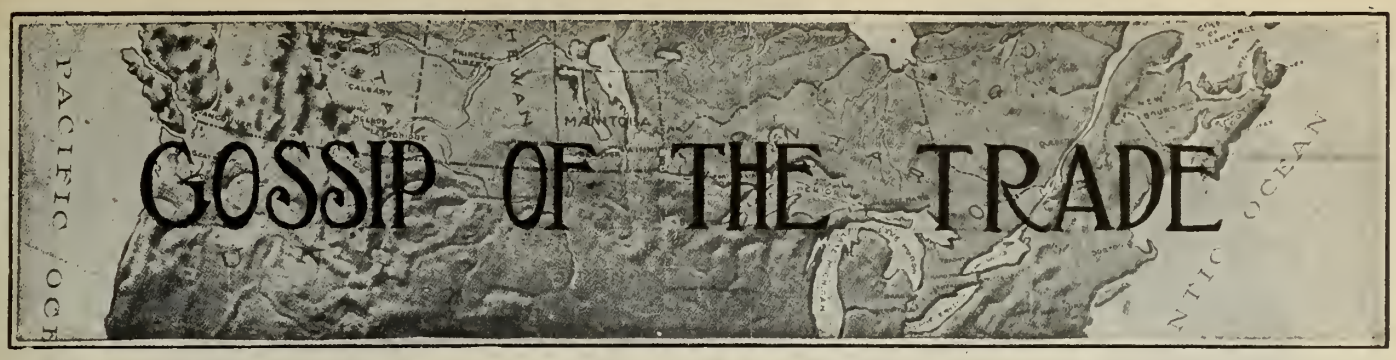
LEAD AND ZINC PRODUCTS.—A firmer undertone to the market on manufactured lead products is noted this week. This has not resulted in a quotable change upward, but it seems to have stopped the downward movement. Both tin and lead have strengthened somewhat, and it looks as though solder and lead products may hold quite steadily for some little time. Prices being quoted to-day follow:

Lead pipe lb.	....	$0 12
Lead waste pipe, lb.	....	0 13
Lead traps and bends	....	Net list
Lead wool, lb.	....	0 14
Lead sheets, 4 to 6 lbs., sq. ft., in rolls, lb.	0 11	0 12½
Cut sheets ½ to ¾c lb. extra and cut sheets to size, 1c lb. extra.		
Solder, guaranteed, lb.	$0 35	0 37
Solder, strictly, lb.	0 33	0 37
Solder, commercial, lb.	0 30	0 36
Solder, wiping, lb.	0 29½	0 42½
Solder, wire, lb.	0 40	0 45½
Zinc sheets, per lb.	....	0 20

Old Materials Go Still Lower

OLD MATERIALS.—The list has again come in for further revision downward and dealers are not anxious to buy even at prices named to-day. Reviewing the present situation, one of the largest dealers in Toronto had the following to say: "It is hard to believe that prices can go down to a lower level than they are at present. A great deal rests, as far as red and yellow metals are concerned, on what the United States and Dominion Governments intend to do with the scrap metal they have in their hands at present. There are millions of tons of this material, and the manner in which it is going to be disposed of will make a great deal of difference as to the future of the scrap metal markets. If the policy adopted is simply to throw this material on the market, why, it means that the situation will be glutted, and prices may stop hardly short of nothing at all. If, on the other hand, they decide to control the release of this scrap, and allow it to come out in quantities that can be readily absorbed in the trade, then matters may be much better and a gradual recovery would be looked for by the trade. Much the same condition prevails in the other lines of machine shop scrap, and the Government

(Continued on page 30)



OTTAWA NOTES

New Plumbing By-law to be Discussed

The Ottawa plumbing by-law will again be up for consideration shortly. This by-law received its first reading in the council some time ago, at which time the local architects raised an objection because they felt that they should have been consulted in the matter. They then undertook to draft a by-law themselves, which they considered would be suitable.

Business Dull

Master plumbers here say business is very dull, and the outlook not particularly bright, unless house-building begins. There is a great scarcity of small houses, and it is hoped that the Government's scheme for the encouragement of building of this class will reflect favorably on the plumbing business.

Start Up in Business

About the only recent change in a business way to be noted here is that C. Rennick, a journeyman, has begun business for himself.

Number of Ottawa Plumbers Killed

About ten of the local plumbers who went to the war have returned. Seven or eight were killed, and there are some overseas. Several of the returned men are idle.

With reference to the by-law above referred to, SANITARY ENGINEER has already taken it up and discussed the good points in it.

The trouble does not lay in the proposed by-law, but rather in the fact that the architects of Ottawa were not consulted regarding the compiling of same.

There could be no harm in discussing such matters with a board of architects if there were any logical reason for so doing.

Very few architects actually know anything about engineering of any kind, least of all plumbing and heating, therefore why should they be consulted?

There is just about as much reason in plumbers and sanitary and heating engineers asking to be consulted about architecture. No plumber would ask to be taken into the confidence of architects regarding matters architectural.

The biggest troubles we have to-day with poorly laid-out plumbing and heating systems, result from the interference of architects. Sanitary engineers want to co-operate—they must do so—with architects, but there is a great deal of difference between co-operation and domination. Sanitary engineers, as well as heating experts, are willing to co-operate. It is the architects who seek to dominate, and in the case of Ottawa's new plumbing by-laws, there are no practical reasons why the architects should have taken the stand they did. It is they, and they alone, who are responsible for the delay in having this by-law passed.

SANITARY ENGINEER desires to see more co-operation between all branches of the building trade, from the architect down.

PRESIDENT LOUTRELLE
Of the Montreal and District Master Plumbers' Association who sees a bright outlook for 1919.

NEW BUILDING INSPECTOR APPOINTED

W. C. Beattie, newly appointed Superintendent of Buildings, Board of Education, Ottawa, well known in heating business in and around Ottawa, becoming associated early in 1915 with the C. A. Dunham Company, Limited, as heating engineer and manager of their Ottawa office.

Previous to this Mr. Beattie had followed the architectural profession and was also in the employ of the Johns-Manville Company. His experience will have equipped him to very efficiently look after the welfare of pupils in Ottawa school buildings.

MONTREAL NEWS

The many friends of James R. Meadowcraft, manager of the Garth Company, Craig street, Montreal, will regret to learn that his health has not been of the best for some time.

Mayor James Ballantyne, Montreal West, and Mrs. Ballantyne, have left for Atlantic City in company with Mr. Ballantyne's brother, Hon. C. C. Ballantyne, Minister of Marine and Fisheries. They expect to be away several weeks.

The Master Plumbers of Montreal held their annual bonspiel at the Caledonia rink on Tuesday last. While the ice was not in good condition, there was a considerable amount of interest, and the report of the scoring and prizes will follow.

Indications are developing most favorably as the date of the annual convention of the Canadian Society of Domestic Sanitary and Heating Engineers' approaches, that there will be a big time on June 4th and 5th. All that seems necessary upon the part of the trade throughout the country is enthusiasm and co-operation. It is high time that every member, who can do so, arrange his plans so that he can be in Montreal on these two days. The time and money spent will prove a real investment, for there are many big things to be discussed, and the personal contact will be most beneficial. Let all plan to make this the biggest and best convention ever.

HALIFAX PLUMBING INSPECTOR RESIGNS

J. Morrissey, city plumbing inspector of Halifax, has sent in his resignation, to take effect on May 1st, when, it is understood, Mr. Morrissey will go into partnership with Franch Purcell in the plumbing and steamfitting business.

Mr. Morrissey has always been a hard and faithful worker and did especially fine service in the time following the explosion, working night and day. Halifax loses a faithful civic servant with his retirement.

Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published--Description of Jobs Done or Shop Kinks Are Also Invited.

INFORMATION WANTED RE FLUSHOMETERS

Editor SANITARY ENGINEER:—Will you kindly answer the following questions with regard to direct flush valves for W. C.?

First, does the quantity of water used at each flushing vary in different makes of valves?

Second, provided the valves are properly adjusted, would a difference in pressure, such as would be obtained between a basement floor and the upper floors of a building, affect the quantity of water used, or merely the speed at which the flushing takes place?

Third, how much water should such a valve pass at each flushing with a pressure of 30 lbs. per square inch?

AN ALBERTA SUBSCRIBER.

In the first place, before answering our inquirer, it would not be out of place to state that a direct flush valve or flushometer is an apparatus which is supposed to and does take the ploce of a W. C. tank. And it should also be stated that some W. C. bowls require more water to thoroughly flush them out than others; also that W. C. tanks, like flushometers, can be made to discharge any quantity of water desired, except that, in the case of the tank, the volume of water is limited to the capacity of the tank from the lowest level to the overflow pipe. But, suppose this happened to be 5 gallons, the tank could be set to discharge as low as 1 gallon; this, of course, would be accomplished by setting the automatic ball cock to close off when the tank contained 1 gallon of water, or possibly a little more. But in the case of flushometers, they can be adjusted to discharge almost any quantity, because they are directly connected to the water supply.

Regarding the first question asked by "Alberta Subscriber":

No, the quantity does not vary because the variation is not in the valve itself, but in the adjustment, so that almost all valves could be set to discharge any given volume desired.

Second question: Such valves are not, as a rule, set before they are installed, unless the pressure has been first determined; for example, turn to Fig. I, which shows 4 W. C.'s connected to a city water supply direct. The flushometer in the basement would have to be adjusted, or rather closed down more, because it is nearest the water supply, and is not subject to any very great elevation. The flushometer on the first floor would be opened up more because there is a certain amount of the pressure required to simply elevate the water to a higher level, and the same arguments would apply to those flushometers on the floors above.

It will be noted in Fig. 1, however, that the pipe at the stop cock is smaller, above the first tee it is larger, and is increased in size as it rises from floor to floor. This is because flushometers require both pressure and volume, and when a flushometer system is installed, it is always desirable to make sure of volume.

In replying to the third query, we may state that it is not a case of volume under any given pressure, because some flushometers would discharge more than others, according to their construction.

It is rather a matter of how much water the W. C. bowl needs to thoroughly cleanse and discharge all the solids from the bowl. For example, take the amount of water flushed from an ordinary W. C. tank. It takes 10 seconds to discharge four gallons of water from a W. C. tank, the high water level above the top of the bowl inlet being 19 inches, the bend being 2 inches in diameter. Now, allowing the 1-inch static head for friction, the pressure amounts to approximately ¾ lb., or equal to about ½ lb. per foot head.

We will now ask our readers to turn to Fig. II. This shows how, say, the same type of flushometers would have to be installed. They are supplied with water from a cistern above and such an installation would not be affected by variation of pressures because the installation shown in Fig. 1 is affected by any variation in city pressures and at certain times this may be great. In most cities the domestic water supply is used for fire purposes and when a fire occurs in a certain district, the pressure is boosted up. This would affect the discharge of flushometers installed as per Fig. 1, and the writer has been informed of many cases where flushometers have been damaged by such occurrences. On the other hand, if flushometers were regulated, say with the pressure at the city main standing at 60 lbs. per square inch, and because of a defective city

Forgetting

One of the things we all do well is to forget.

Names that were household words yesterday are gone to-day.

Because people knew your Name and your Line a year ago it is no sign they do to-day. They forget easily.

Keep yourself in the public mind by advertising. It is just as important to make old friends remember as it is to win new friends. Advertising does both.

main the pressure was considerably reduced; then the reduction, too, would affect the volume discharged.

Now, such a condition could not be established where flushometers are installed as shown in Fig. II. The cistern is supplied with an independent supply pipe, controlled by an automatic ball cock, and as the ball cock may be set to open and close with a variation of one foot, the small amount of head loss, would not affect the flushometers would not affect the flushometers on the floors below. Not only so, but in case water was turned off the building for a short time, there would be a supply of water in reserve, the quantity

Continued on next page

TORONTO NEEDS MORE PUBLIC COMFORT STATIONS

Speaking editorially, the Toronto "News," in its issue of March 5th, condemns the lack of public comfort stations in Toronto.

At the present time there are only eight in the city, situated as follows: Broadview and Queen, Parliament and Queen, Toronto and Adelaide, Shaftesbury Avenue and Yonge St., Spadina and Queen, at the Sunnyside station on King St., Lansdowne Avenue and Dundas St., and Keele and Dundas.

The majority of these are underground, and the one at Shaftesbury and Yonge is only housed in a temporary building.

Property Commissioner Chisholm is urging that three additional stations be installed. The Board of Control is only prepared to vote $17,000, to provide one additional station, at the present time. The eight in existence cost $36,200 in upkeep.

We agree with our contemporary in asking that in spite of the expenditure the additional accommodation, which the growth of the city has made necessary, be provided. In the words of the "News," "No one looking at a map of Toronto will admit that the city is completely or adequately served in this respect."

WHEN DOES STEEL BECOME SCRAP?

When is steel scrap? This is the question which was raised in the United States courts when the G.T.R. protested a duty of 10 per cent. ad valorem on wornout steel bridge, which had done duty for 15 years, which they were shipping as scrap into the States.

The American customs department levied the duty mentioned, claiming the bridge was dutiable under the Act of 1913 on structural shapes of iron or steel, but the railway protested and at length the Board of General Appraisers rendered a decision that the old bridge was scrap, and, therefore, duty free.

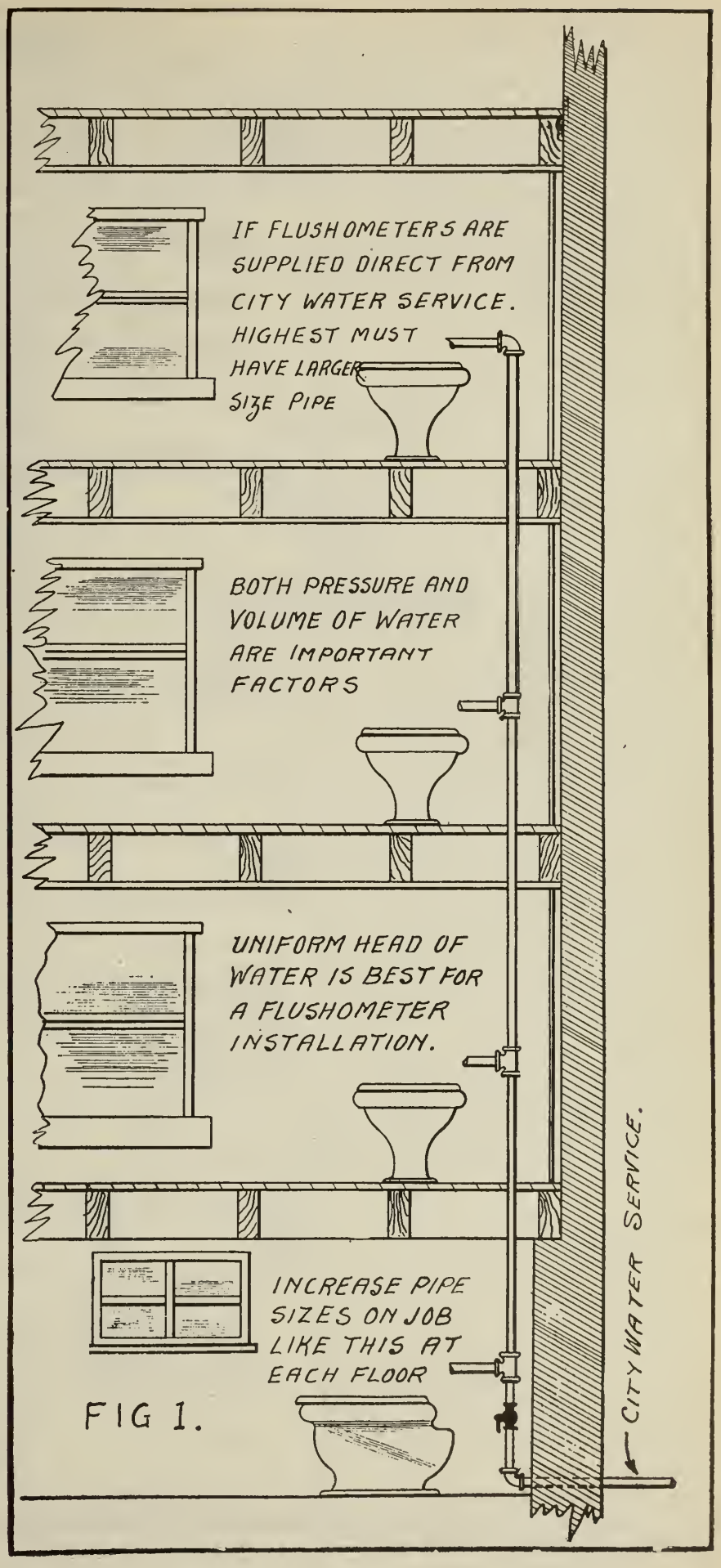

IF FLUSHOMETERS ARE SUPPLIED DIRECT FROM CITY WATER SERVICE. HIGHEST MUST HAVE LARGER SIZE PIPE
BOTH PRESSURE AND VOLUME OF WATER ARE IMPORTANT FACTORS
UNIFORM HEAD OF WATER IS BEST FOR A FLUSHOMETER INSTALLATION.
INCREASE PIPE SIZES ON JOB LIKE THIS AT EACH FLOOR
CITY WATER SERVICE.

FIG 1.

THE QUESTION BOX

Continued from page 27

being, of course, determined by the size of tank.

It will be noted that the pipe from the cistern to the first floor below is the larger size, and sizes are less as the various floors below are reached. This is because of the static head, the pound pressure per foot being greater the lower the pipe drops. Therefore a larger quantity of water will pass through the smaller pipe at the lower floor. Many manufacturers of flushometers prefer the installation as shown in Fig. II to that shown in Fig. I.

TO INVESTIGATE DISPUTES

The Senior British Trade Commissioner in Canada and Newfoundland (Mr. G. T. Milne, 367 Beaver Hall Square, Montreal) has been notified by the Imperial Department of Overseas Trade in London that he is empowered to appoint an expert to examine and report upon consignments of goods from the United Kingdom, in respect of which a dispute has arisen, and to certify the signature of such experts as authentic. The Commissioner will, however, only intervene when requested to do so by both parties to the dispute.

The kind of disputes in which the commissioner may intervene are those regarding goods which are alleged to be not up to sample, or which have arrived in a damaged condition, owing to faulty packing. The Commissioner is not authorized to deal with claims under insurance policies for goods damaged during the voyage.

As the official Trade Representative in Canada and Newfoundland of the Indian Government, the Commissioner is also authorized to act in regard to disputes relative to shipments from India.

The remuneration of experts appointed by the Commissioner is a matter for the parties to the dispute. No fee will be charged for his services.

The British Trade Commissioner at Toronto (Mr. F. W. Field, 257 Confederation Life Bldg., Toronto) is empowered to act in disputes out of shipments to Toronto and to other centres in Ontario.

MORE MONEY FOR CHIEF ENGINEER AT TECK

The Advisory Industrial Committee of the Board of Education decided to raise the salary of the Director of Engineering of the Technical School, which is now vacant, owing to the death of Mr. M. L. Smith, who was accidentally electrocuted some weeks ago. Only four applications for the position were received by Dr. McKay, and it was upon his pointing out to the committee that a good man could not be obtained for a salary of $2,400 a year, that after some discussion it was raised to $3,500.

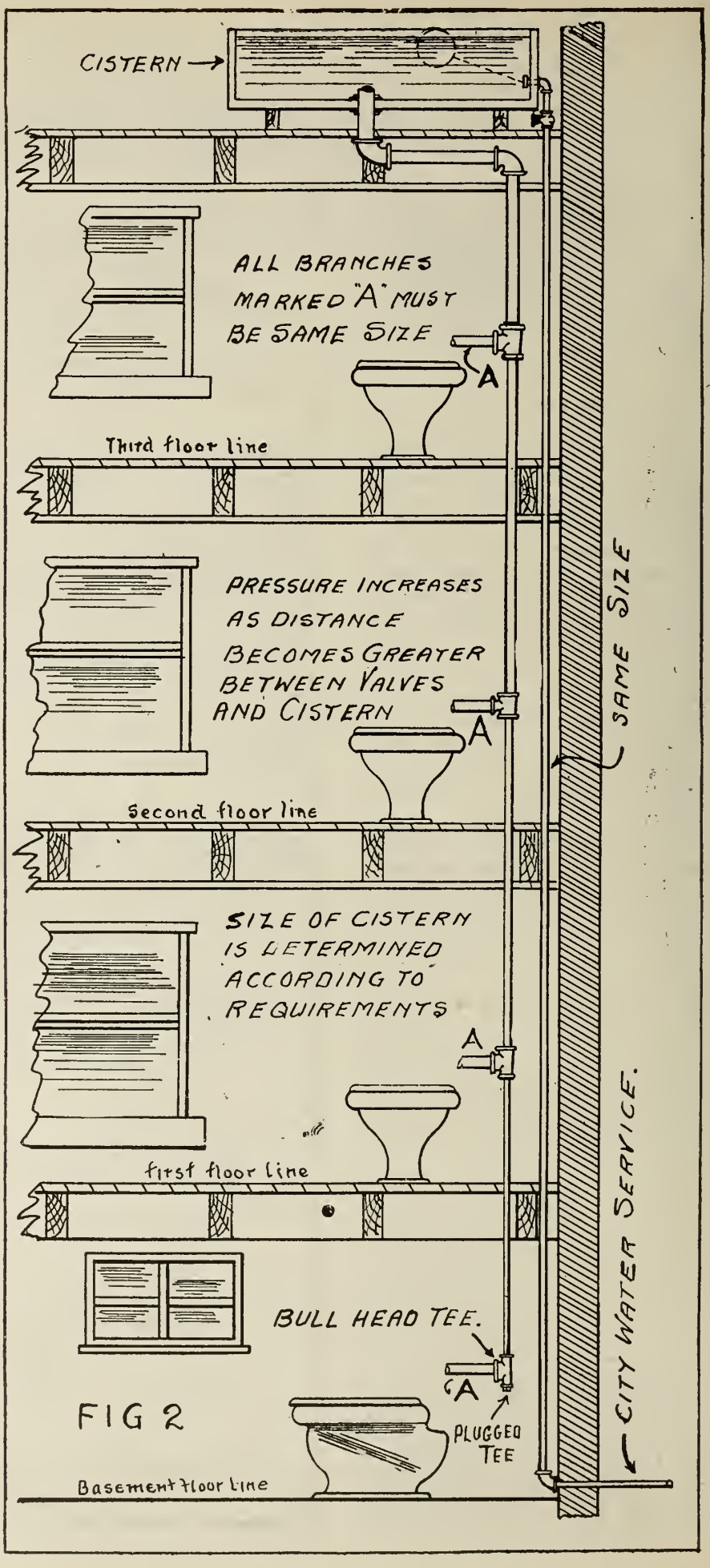
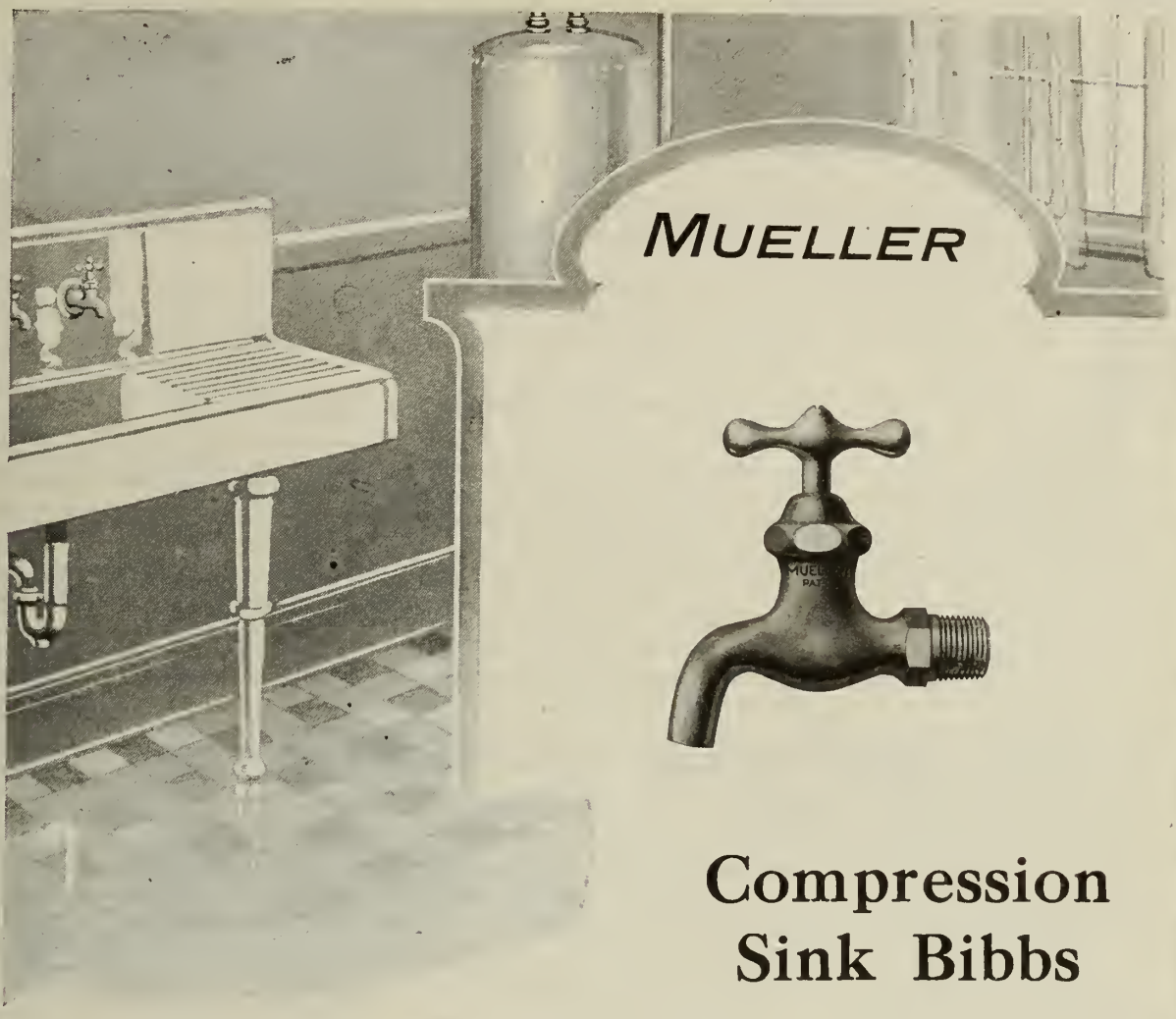


FIG 2



Compression Sink Bibbs

SIMPLE elegance, combined with superior strength and wearing quality, is what you give your customer when you install **MUELLER** goods.

The many advantageous features of **MUELLER** compression bibbs give maximum service from the bibb as a whole. The anti-spreading device that breaks up the whirling motion of the water and the corrugated stem and handle, allowing the handle to be set at any angle without becoming loose or wobbly, are only two of these features.

MUELLER Bibbs are the best the market affords. Write for prices.

H. Mueller Mfg. Co., Limited

SARNIA CANADA

MUELLER

PRACTICAL SHEET METAL WORK

(Continued from page 19)

drawing a solid line through the points of intersection.

This will give a one-half pattern up to point K.

Fig. 4 shows how the top piece A, B, K, is developed, which is really a repetition of the course followed when drawing the half pattern, except that the full pattern of this piece is shown, by simply placing the compass on the stretchout line C, D, at the different points 1, 2, 3, 4, 5, 6, 7, and 8, and, dividing the vertical lines into equal portions below the stretchout line.

(Continued in next issue.)

HEAT LOSS AND HOW TO CONSERVE IT

(Continued from page 20)

comprised. Air cell asbestos, if not made air-tight at the joints, can have its efficiency greatly lowered. Magnesia covering is very good, but requires careful handling. It is easily broken, though it does not depend upon tight joints, and when such covering is broken it can be mixed up again with water and molded onto fittings.

Early pipe coverings were made up in a very crude way of wood lagging, chopped hay, feathers, or hair, and these materials were then covered with mud. The writer can well recall having to cover steam boilers with sawdust and clay, just sufficient of the latter to make the sawdust, cut hay, hayseeds, and the like, adhere to the apparatus to be insulated.

But to-day, no such crude methods need to be adopted. There are a large number of pipe and boiler coverings, all made to sizes, etc., and in various forms. The greatest trouble of all is that so little is used in comparison to the amount that should be used, which would result in almost solving the transportation problem of this Continent.

MARKET CONDITIONS AND TENDENCIES

(Continued from page 24)

can do much one way or the other to stabilize the market for this material. Until these points are decided, it is hard to see how there can be anything approaching a betterment in the conditions of trade."

Dealers brought down the prices on all grades of coppers again this week, crucible, heavy and wire now being placed where dealers offer only 12¾c per pound for them. Brass cuttings and turnings, both red and yellow, are also down considerably. Perhaps the most noteworthy drop is in heavy melting steel, which sank to-day to the low quotation for Toronto yards of $9 per ton, while boiler plate comes down to $8. There is certainly nothing in any of these quotations to tempt holders disposing of their material, and dealers claim they do not want to take on anything for fear of still lower levels.

Dealers' Buying Prices—		
Tea lead		0 03
Heavy lead pipe		0 04
Pipe scrap		8 00
Stove plate per ton		10 00
No. 2 busheling		8 00
Yellow brass		0 06
Red brass		0 08½
Light brass		0 05
Scrap zinc		0 05
Heavy copper		0 15
No. 1 machinery cast		14 00
Wrought iron, No. 1, per gr. ton	18 00	15 00
Heavy melting steel		9 00

Copper, Lead, Tin Declines Halted

INGOT METALS.—The downward move in copper, tin and lead seems to have stopped, and dealers seem to feel that, considering present-day costs, all ingot metals must be pretty well down to a pre-war basis. It would appear that there can be no industries using large quantities who will really be in a much more favorable position to buy than at present. Three big consuming months are at hand, which may be expected to steady, if not stiffen, the markets, and whereas the summer may see some slight reaction from present levels, the declines cannot be as great as those already affected by any means.

COPPER.—Copper seems to have reached an attractive basis of selling now, and there is more business being placed. Prices locally range around 20c per pound, and outlook seems much better than it has for some time.

TIN.—There is a very fair demand and the market has firmed up with lowest quotations for the week being made at around 60c per pound. Supplies seem to be very fair and outlook is considered much better.

SPELTER.—The market is quiet and there is little of great interest to the trade. Buying is within rather a narrow compass and supplies ample. Quotations locally are being made at 8½c per pound.

LEAD.—The market is firmer and prices have advanced again slightly. Locally quotations are being made around 7½c per pound. There is some business being handled and outlook seems satisfactory.

ALUMINUM. — Open market conditions now prevail on this metal, but this has made little apparent difference as yet, buying interest being lacking. Quotations nominally range around 50c per pound, with lower prices probably available for actual business.

ANTIMONY.—The market is purely a routine affair. Price holds around 8½c per pound with little activity to move stocks.

NEW CANADIAN PATENTS

(Continued from page 21)

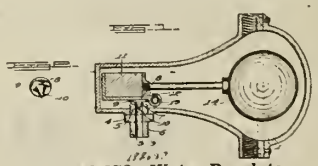
2. The combination of a heater having an outlet opening for the products of combustion, a jacket surrounding said heater and spaced therefrom to provide a chamber, said jacket being made in a plurality of sections, said sections being detachably secured together, baffle plates having outer edge portions secured between said sections and having wing portions extending into engagement with said heater, a segmental baffle spaced below the top of the jacket extending from said wings and separating said outlet opening of the heater from one of said compartments, said jacket having an opening below the segmental baffle leading from said latter compartments, said baffle plates providing a passage between said compartments whereby the products of combustion are compelled to pass around and in contact with the outer surface of said heater prior to passing out of the opening in the jacket, substantially as described.

3. The combination of a heater having an outlet opening for the products of combustion, a jacket surrounding said heater and spaced therefrom to provide a chamber, said jacket being made in a plurality of sections, said sections being detachably secured together, baffle plates secured between said sections and having wing portions extending into engagement with said heater, a segmental baffle extending from said wings and separating said outlet opening of the heater from one of said compartments, said jacket having an opening below the segmental baffle and leading from said latter compartment, said baffle plates providing a passage between said compartments whereby the products of combustion are compelled to pass around and in contact with the outer surface of said heater prior to passing out of the opening in the jacket, said segmental baffle having an opening therein above the space between the outer side of the heater and the inner side of the jacket, and a damper for normally covering said opening, substantially as described.

Claims allowed, 3.

Ernest G. Ofeldt, Nyack, New York, U.S.A., 11th February, 1919; 6 years. Filed 2nd July, 1918. Receipt No. 296,790.

Claim.—In a meter regulator, the combination with a casing, a nipple entering the same and having a valve seat at its inner end and a float lever pivot-



No. 188,672. Water Regulator

ally mounted in said casing and having a weight at one end of a freely movable valve comprising a disc resting freely against the under face of said weight, and a conical portion to enter the nipple and to engage the seat at the inner end thereof.

Claims allowed, 1.

—A REMEDY—

For Inefficient Heating Systems

THE KNICKERBOCKER AUTOMATIC HEAT GENERATOR

How about those Badly Working Hot Water Heating Systems your customers were telling you about? Were you able to give expert advice for remedying the faults?

The **Knickerbocker Automatic Heat Generator** meets a necessary want in such a situation.

It increases Radiation 25% to 50%. Makes the old system work like new, with a substantial saving in fuel. As necessary to the new installation as to the old.

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Manufacturers and dealers in a complete line of plumbing and heating supplies.

The James Morrison Brass Mfg. Co., Ltd.

93-97 Adelaide St. W., Toronto, Ont.

WISCONSIN APPRENTICESHIP SYSTEM

(Continued from page 22)

V. Drawning

The young mechanic must learn to use a pencil so as to make illustrative sketches to describe work that he is doing, as well as to assist him in planning a design. He should acquire the ability to read accurately blueprints, specifications, and all other working drawings. No man can be a proficient mechanic until he is able to read working drawings pertaining to work in his trade.

VI. Arithmetic

Knowledge of the fundamentals of arithmetic should be acquired, embracing:

Addition
Subtraction
Ordinary multiplication
Division
Fractions

The apprentice should learn the tables of:

Commercial weight
Liquid measure
Square measure
Cubic measure
Trades tables, rules and calculations.

A journeyman should be able to estimate proper amount of grade for drainage, to calculate water pressure, etc., and to compute drainage area, capacities, and the like.

VII. Physics

The apprentice should learn elementary physics such as pertain to his trade. He should know the effects of heat and cold on lead, tin, brass, and iron, and such other factors as are detrimental to plumbing materials. He should be acquainted with the principles of physics involved in the water hammer, pump, syphon, and trap.

VIII. Chemistry

A plumber should know the chemistry involved in the use of lead, tin, brass, red lead, white lead, lithrage, cements, fluxes, sewer gas, septic tanks, water contamination, and electrolysis.

IV. Practical Tests of Workmanship

A Journeyman should be able to:

(a) Accomplish satisfactorily the average sized plumbing installation except important factors in design.
(b) Perform efficiently ordinary repair work.
(c) Understand the principles of plumbing and drainage outlined in the Wisconsin Code.
(d) Know the meaning of plumbing terms.
(e) Read working drawings, specifications and instructions.
(f) Understand the various types of fixtures.
(g) Know the various kinds of traps and their purposes.
(h) Understand the fundamental purposes of plumbing ventilation.
(i) Perform all work in a workmanlike manner.
(j) Know how to apply tests to old and new installations.
(k) Distinguish between insanitary and inefficient work, and the reverse.

X. Business Principles

A plumber should acquire an elementary knowledge of business principles which would include:

(a) An understanding of contract.
  1. The significance of contract.
  2. Principal elements in contract.
  3. Law of contract.
  4. Meeting of business obligations.
(b) Cost principles in business.
  1. Capital investments.
  2. Overhead charges.
    Depreciation funds.
    Insurance, etc.
    Interest.
  3. Cost of material.
  4. Cost of labor.
(c) Principles of buying.
(d) How and when to taken inventory of stock.
(e) How to estimate cost of a job.
(f) How to charge and credit job materials.
(g) How to write simple business letters and make specimen bids or estimates.

XI. Related Trade Information

The mechanic should be acquainted with the institutions and practices suggested below which concern so vitally his work in the trade:

The laws, rules and regulations governing plumbing, drainage, and water supply installations and inspection;
The functions of the State Board of Health and of local governing bodies, and the relation they bear to his work;
The functions of the Industrial Commission of Wisconsin as they pertain to his work, and the requirements of building codes;
The necessity for regulation of plumbing and other work vital to the welfare of the public;
Something of the obligations of citizenship;
The principles of trade organizations and cooperation, both of employers and employees.

Conclusion

It is essential for an apprentice to become familiar with the best published works bearing on his trade. The more varied and constant is his reading, the more capable and successful is he likely to become in the pursuit of his calling. There are several standard works on the theory and practice of plumbing. These should be read and studied. The apprentice should also read whatever books are recommended by the Plumbing Division of the State Board of Health or the Wisconsin Plumbers' Apprenticeship Board. To gain acquaintance with the best thought and latest knowledge in the plumbing industry, he should read regularly one of the excellent trade journals devoted to the craft. Above all else an apprentice should become familiar with the provisions of the Wisconsin State Plumbing Code, which govern all plumbing and drainage work done in the state.

Occasionally advertisements are inserted in the paper after this page has gone to press. The insertion of the Advertiser's name on this page is not part of the advertising order, but is inserted solely for the convenience of the reader of the paper

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GASOLINE ENGINES

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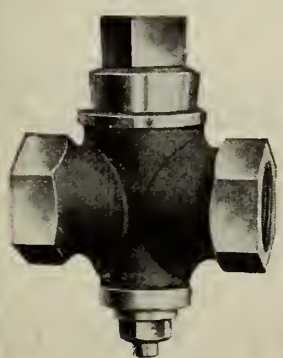

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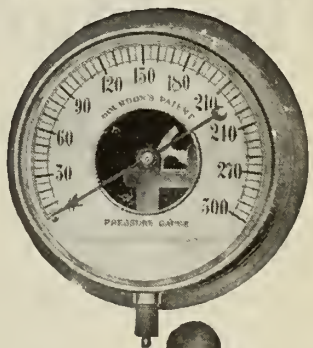

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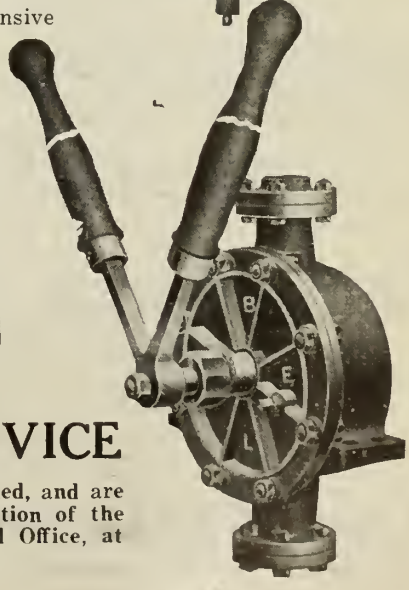

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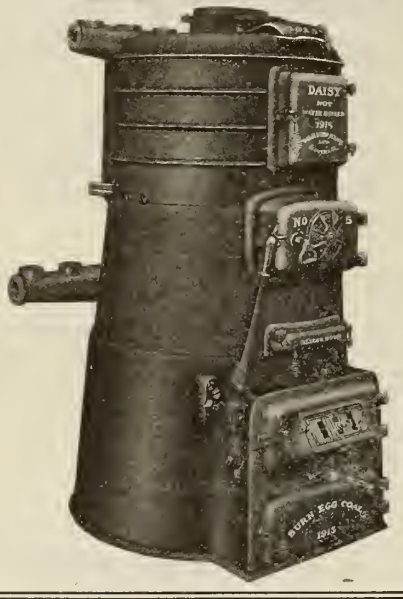

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THE SANITARY ENGINEER (Est. 1907)
MARINE ENGINEERING OF CANADA (Est. 1910)
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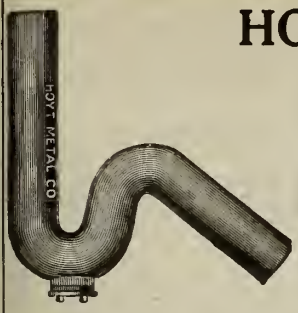

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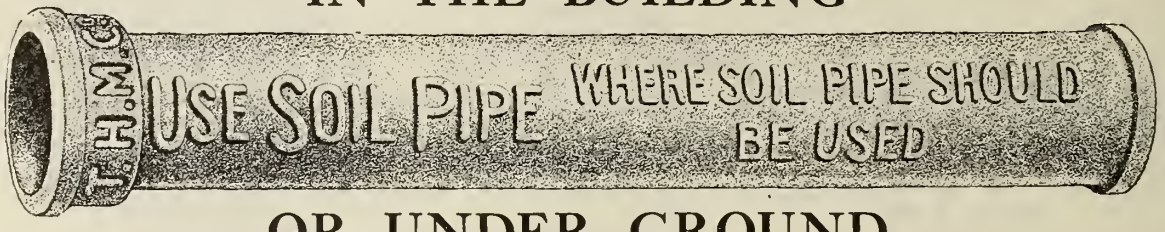

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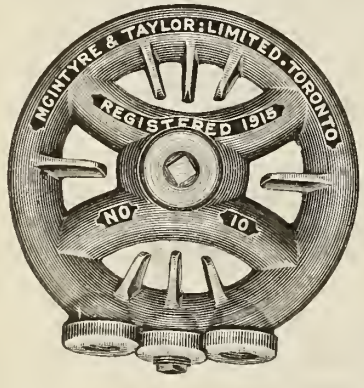

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Belanger, O., Regd. 34
Borden Canadian Co. 40

Canadian Tube & Iron Co. 36
Canadian Wolverine Co. 38
Canada Metal 2
Chamberlain Desolvo Co. 4
Consumers Metal Co. 40

Dart Union Co. ..... Inside Back Cover

Empire Manufacturing Co. . .Outside Ft. Cover

Galt Brass Co. ..... Back Cover and 9
Goodwin, F. 4
Gummer, G. & W. G., Ltd. 1

Hause Mfg. Co., Chas. F. 40
Hoyt Metal Co. 35

International Malleable Iron Co. 7

Jardine, A. B., & Co. 7

Kerr Eng. Co., Ltd.. .... Inside Back Cover
Katy Foundry Co. 34

MacDougall & Co., R. 38
McIntyre & Taylor, Ltd. 36
Moline Heat 5
Morrison Brass Mfg. Co., Ltd., Jas. 31
Mueller Mfg. Co., H. 29

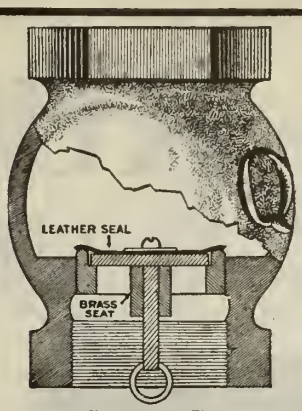
Port Hope Sanitary Mfg. Co. 10

Scaife, W. B., & Sons Co. 35
Simplex Manufaturing Co. 40
Standard Sanitary Mfg. Co. 3
Steel & Radiation, Limited 6

Trimont Manufacturing Co. 39
Toronto Hardware Mfg. Co. 36

United Brass Founders & Engineers, Ltd. ..33

Warden-King, Ltd. 31
Wallaceburg Brass Co. 6
Williams, J. H., & Co. 39



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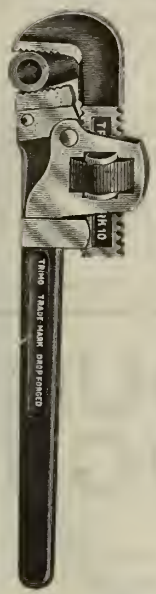

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OPEN VIEW
NO. 10-A

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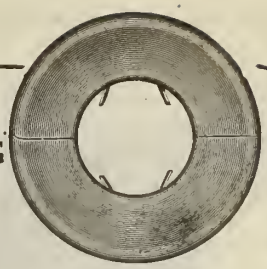

TOP VIEW
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THE NO. 10—A NARROW FLANGE PLATE—IS A STEEL HINGED PLATE. FLANGES ¾" WIDE. HIGHLY FINISHED. ESPECIALLY DESIGNED FOR TWIN CONNECTION "NARROW."

Gem No. 4.

The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

High quality at the right price.

Gem No. 4 Automatic Air Valve

Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

Write for catalog showing our complete line of specialties.

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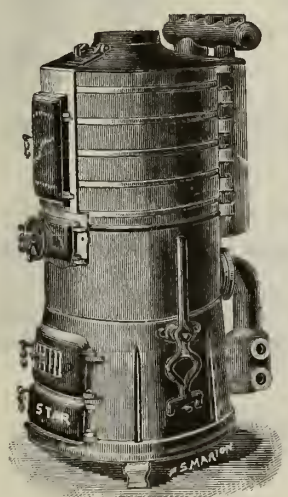

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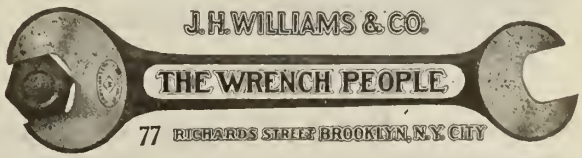

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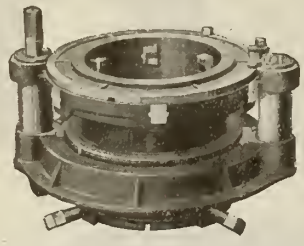

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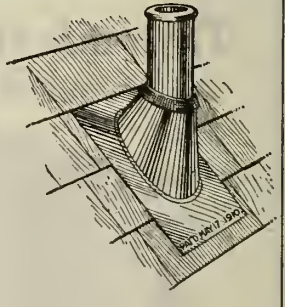

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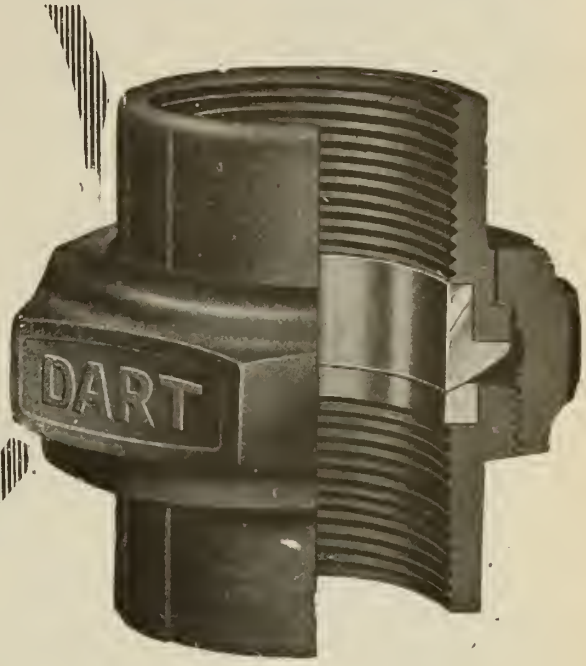

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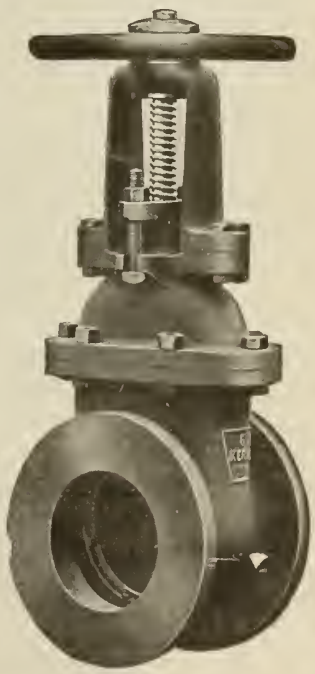

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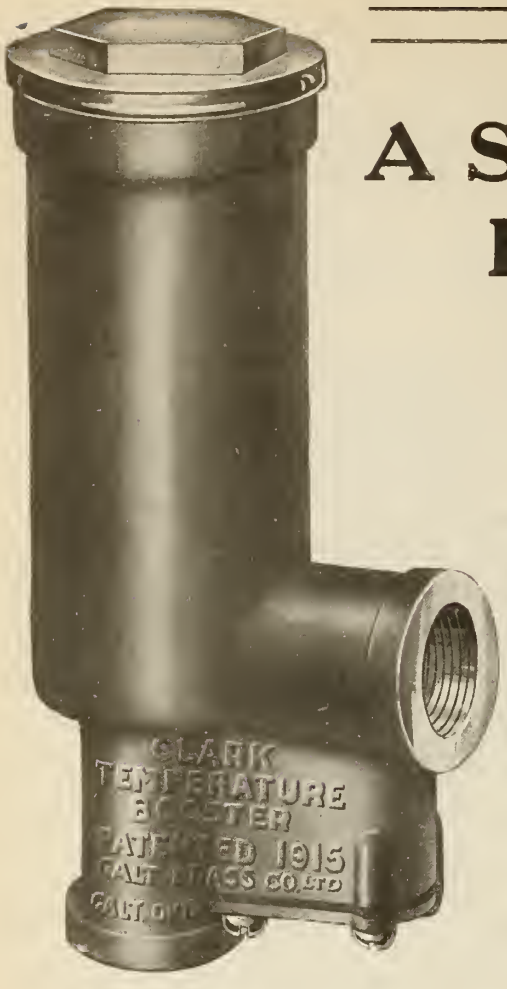

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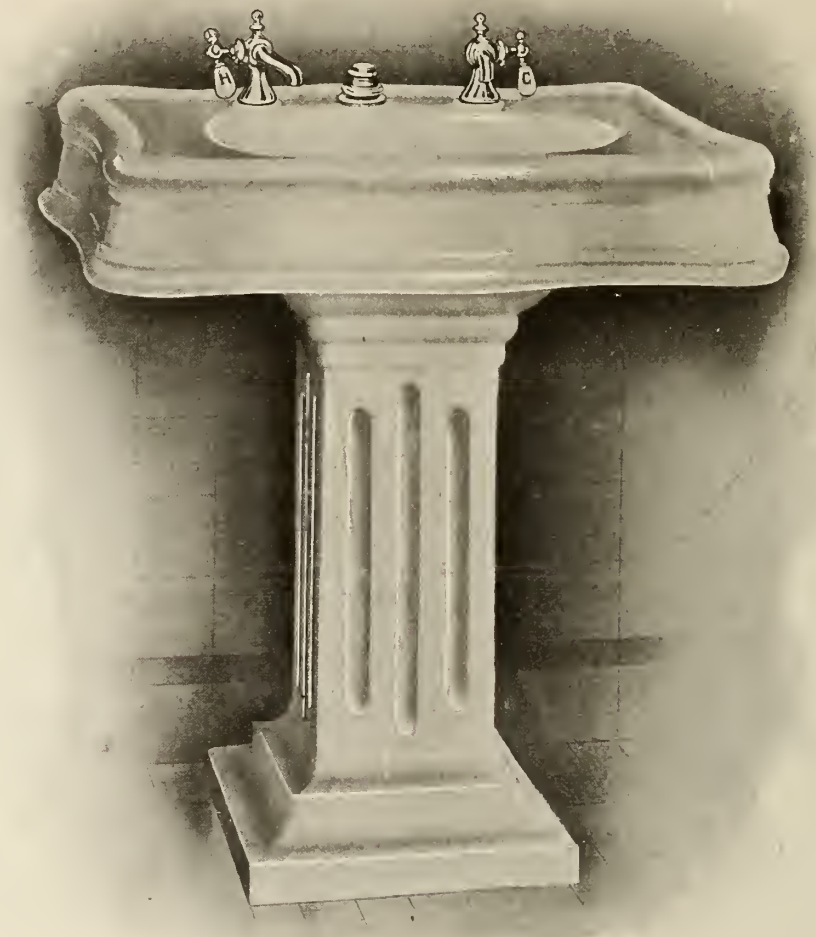

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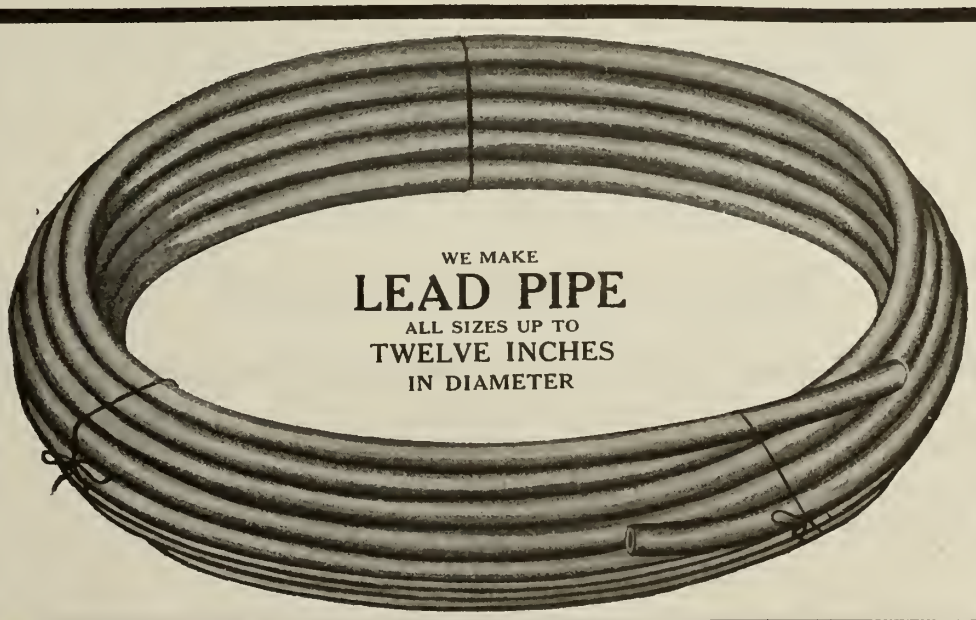

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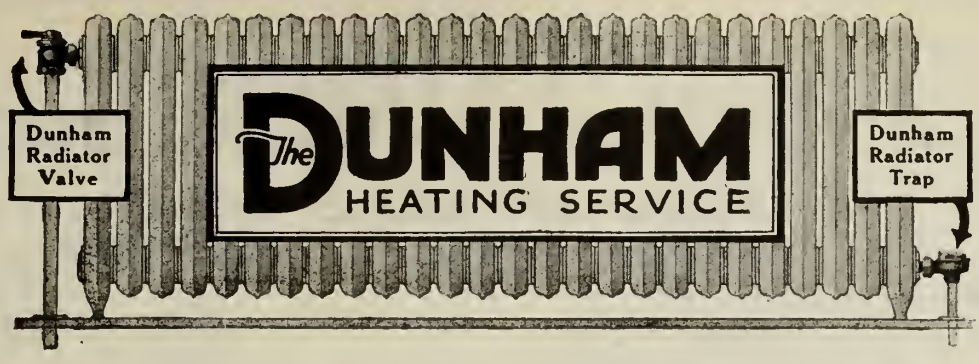

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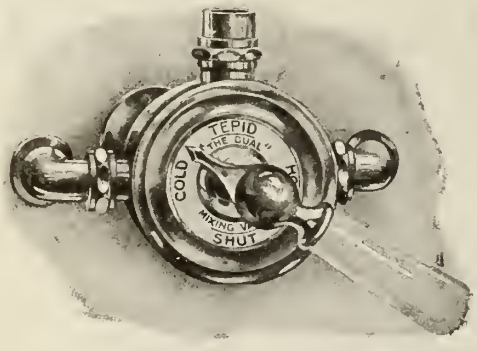

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A valve that really mixes Hot and Cold Water, and maintains a uniform mixture.

For ease of operation, simple construction and easy installation, it has set a new standard of efficiency.

Cold Water must be turned on first, no possibility of scalding.

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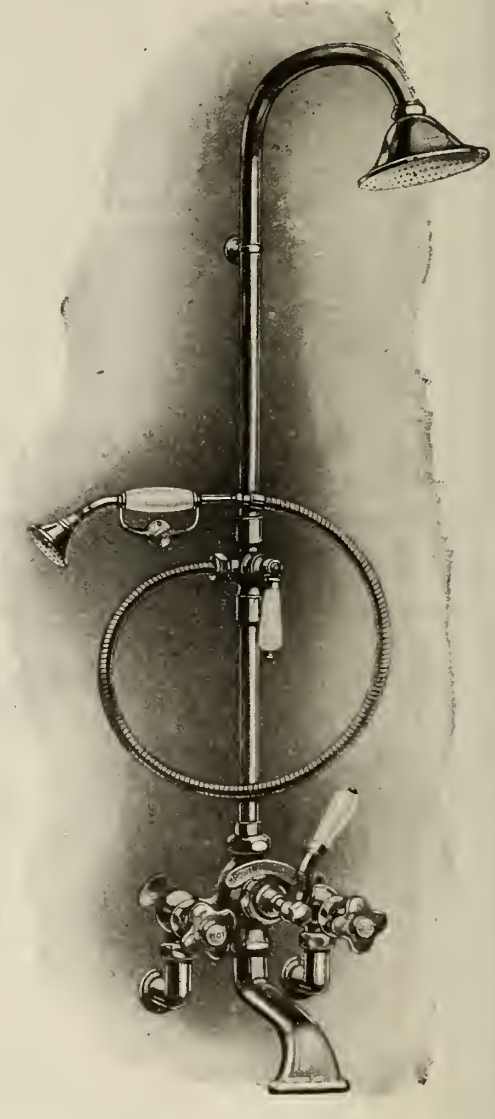

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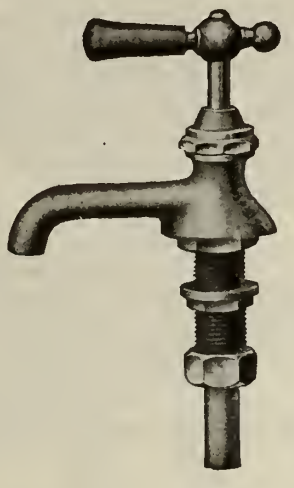

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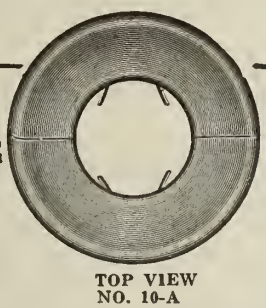

TOP VIEW
NO. 10-A

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Gem No. 4.

The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

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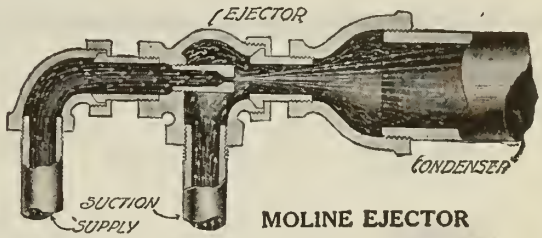

MOLINE EJECTOR

"Moline Heat? What's that?"

"Well, I can't take time to go into details about it just now—I've got to go after that next contract, right away—but if you can drop around after banking hours I'll be glad to show you what a wonderful system MOLINE HEAT is. It's a heating system that runs as accurately as a bank's 17-jewel adding machine—if you have such a thing. It heats *right*, year after year. Moline Heat gives me the foundation and I do the rest—*quality*, all around. 'Consequence is that each of my customers is always as proud of his MOLINE HEAT installation as a kid with a new watch—and he goes around telling everybody else about MOLINE HEAT. Each Moline Heat job brings me in another, Mr. Teller. That's where these deposits come from!"

"Well a heating system that builds up bank balances like yours must be a pippin!"

"You bet it is! Moline Heat for mine!"

Numberless Moline Heat contractors are having similar experiences.

For full particulars about MOLINE HEAT, write to us today. Address Dept. G.

Some excellent territory still open for special sales representatives.

Moline Illinois

First Cost *versus* Upkeep Cost!

The purchase price means nothing if the upkeep cost is not low.

The purchase price of King Boilers is no more than the average boiler and yet—

The consumption of fuel—*the upkeep cost* is lower—considerably lower.

The thin, peculiarly shaped waterways in the "King" mean quickly heated water and perfect circulation, which causes a saving in fuel because it obviates the necessity of "extra firing" to move cold water from the radiators.

The Trade should use this quick-heating, fuel-saving argument now while fuel is scarce and high in price.

WRITE US FOR PRICES.

Steel and Radiation, Limited

Head Office, FRASER AVENUE, TORONTO

304 University Street, MONTREAL **101 St. John Street, QUEBEC**

AGENCIES IN ALL LEADING CITIES

Why Jenkins Bros'. Valves Are Superior

Fig. 106

They are the original renewable Disc Valves. They have more imitators than all other makes of valves combined. They have kept pace with increasing steam pressures and severe working conditions. They are of the simplest design, and can be easily repaired by any man of ordinary intelligence. They are made interchangeable in every part, and any part can be duplicated promptly and inexpensively by the dealer. In the majority of cases they can be repaired by merely changing the disc without the laborious task of regrinding.

Fig. 108

Fig. 114

They are recognized as the Standard Steam Valves in all parts of the World, and wherever there are supply houses—Jenkins Bros'. Valves will be found. The Standard of quality never changes except to improve, and while to-day there are hundreds of imitators, the sales of genuine Jenkins Bros'. Valves are constantly increasing.

Catalogue No. 8 sent free on request.

Fig. 124

HEAD OFFICE AND WORKS:
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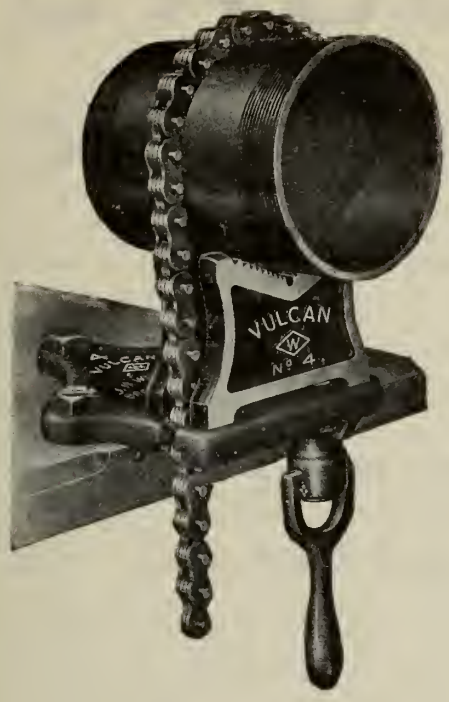
Montreal, Canada

JENKINS BROS.
LIMITED

Agencies in all the Principal Countries of the World

EUROPEAN BRANCH:
6 Great Queen Street
Kingsway, London, W.C. 2
England



Williams' "Vulcan"
Drop-Forged
Chain Pipe Vise

MADE entirely of drop-forged and wrought steel, these Vises are unbreakable, compact, rapid in action and positive in gripping pipe. They are attachable *anywhere*—any handy bench, post, or other support will serve. Remember, Williams' Chain Pipe Tools have been *Standard* for nearly half a century—they are all backed by our absolute and unconditional guarantee of service.

Vises in 3 sizes for ⅛ to 8-inch pipe.

Descriptive Booklet on Request.

J. H. Williams & Co.

"The Drop-Forging People"

177 Richards St., Brooklyn, N.Y.

The A. G. Low Co., Ltd., 77 Pacific Ave., Saskatoon, Sask. Agents for Manitoba, Saskatchewan, British Columbia and Alberta

Western Office and Warehouse 77 So. Clinton Street Chicago, Ill.

WE SPECIALIZE IN

PIPE THREADING TOOLS

Take Another Look At This Job

ESTABLISH PEACE

If you desire to establish lasting peace in your shop, you will have to furnish your men with good tools. Men will not do the same amount of work if that work is hard. The more you *INVEST* in tools if they're good tools, the less you will SPEND in labor. To invest is to establish an asset, to spend is to create a liability. Our tools will save you money and make peace in your shop.

ESTABLISH PROFIT

Work made easy becomes a pleasure. Jardine and Toledo Pipe Threading Tools make threading pipe so easy that a boy can thread a 4-inch pipe as easily as he can thread a ½-inch pipe.

Not only so but when a thread is made with one of our tools it's a good thread. No cutting off pieces of pipe. No lost time and no leaks. That's the way to establish a profit on every job.

A. B. JARDINE & COMPANY, LIMITED, HESPELER, ONT.

Sole makers of "Jardine" Pipe-Threading Tools.
Sole licensees to manufacture and sell Toledo Pipe-Threading Tools in Canada.
Agents, Winnipeg and West—Stanley Brock, Ltd., Winnipeg, Man.

Brockville and East—J. R. Devereux, 358 Beaver Hall Square, Montreal.

Belleville and West—W. H. Cunningham & Co., 183 Church St., Toronto, Ont.

★STEFANSSON'S
OWN STORY *of his*
FIVE YEARS *in the* ARCTIC

Over five years ago Vilhjalmur Stefansson, the famous Arctic explorer, was commissioned by the Canadian Government to lead a party into the uncharted space that extended from the north-westerly boundaries of Canada on to the North Pole. Shortly after the party got away the news came back to civilization that Stefansson and some of his party had drifted out into the Arctic seas on an island of ice and they were given up as lost. But Stefansson came back, safe and sound after four years of amazing adventures, during the course of which he made many discoveries of scientific and geographical value. Mr. Stefansson has written his story of this wonderful journey and exclusive Canadian rights have been purchased by MACLEAN'S MAGAZINE. It starts in the April issue and will continue for six months. It is a thrilling narrative—unquestionably the most important Canadian story of the year.

★ **Stefansson's story will be published exclusively in Canada in MACLEAN'S. The series of articles by him, now appearing in American and Canadian newspapers, refer entirely to his experiences on previous explorations and do not deal with the journey that he undertook for the Dominion of Canada and completed last year.**

Other Outstanding Features of April MacLean's

"Imperial Relations Must be Worked Out," by Viscount Bryce. An important announcement on the future construction of the British Empire.

"Reconstruction in Turkey," by Stephen Leacock. A humorous article on the present condition of things in Turkey as seen by Canada's great humorist, and applied to Canadian conditions.

"Bulldog Carney," by W. A. Fraser. A splendid novelette of the Canadian West, complete in this issue. Illustrated by Charles L. Wrenn.

"Opening the New Book," by J. K. Munro. An article on the situation at Ottawa created by the new Liberal leadership—smashing, impartial, fearless.

"The Sun Gazer," by Charles G. D. Roberts. A remarkable animal story. Illustrated by Artheur Heming.

"Canada's Fishmonger General," by Thomas M. Fraser. An article on a young Canadian who put Canadian fish on the diet of the British armies by a series of Barnum and Bailey advertising stunts.

"Bombing the Boche," by Lieut. J. Vernon Mackenzie. The second of the two articles that Mr. Mackenzie has written on the whirlwind campaign of raid reprisals which so frightened all Germany.

"The Transformation," by Frederic S. Isham. Illustrated by Hanson Booth. The second instalment of this sparkling new serial.

"Man and Wife," by C. W. Stephens. Illustrated by R. M. Brinkerhoff. The first instalment of a three part story of Canadian life by a new Canadian writer—a delightful love story with a background of business intrigue.

The Review of Reviews

The best articles from all publications the world over are selected and condensed for this department. Some of the articles in the April number are:

The Man Behind Bolshevism.
Could German Fleet have been Destroyed.
The Secret Plans of the Allied Command.
Too Much Wilson.
Is the ex-Kaiser Haunted?
Next Government Will be Labor.
New Life of Deposed Princess.
A New Kind of Socialism.
Are We Communicating With Mars?
The Cohort of the Damned.
Has War Wiped Out Disease?
The Red Terror in Russia
The Sultan Takes Hold.
Some Tricks of the Mediums.

Over 65,000 Canadian Families Buy

MACLEAN'S

"CANADA'S NATIONAL MAGAZINE"

APRIL ISSUE *Now On Sale At All News Dealers*

20c PER COPY. $2.00 PER PEAR

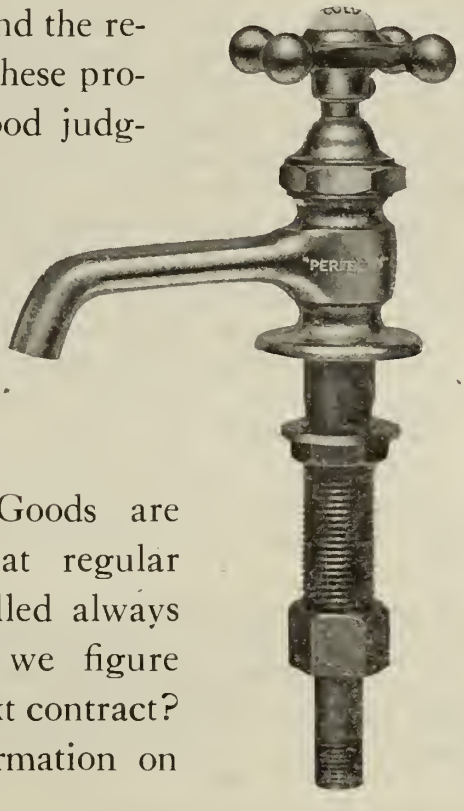
Dealers who have not been handling MACLEAN'S should secure copies at once from their nearest wholesaler.

If there are no newsdealers in your town, or if your newsdealers cannot supply you, send 20 cents for a sample copy or $2.00 for a whole year's subscription to MACLEAN'S MAGAZINE, 143-153 University Avenue, Toronto, Canada.

TRADE PERFECTO MARK

QUALITY BRASS GOODS

The plumber handling "Perfecto" Quality Brass Goods enjoys a distinctive prestige over his competitors. The service at his disposal and the reliability attached to these products reflects his good judgment in increased sales and profits.



"Perfecto" Brass Goods are superior products at regular prices. Once installed always satisfactory. May we figure with you on your next contract? Write for full information on our complete lines.

Our Guarantee:

Any article of our make proving defective through inferior metal or improper workmanship, on our part, will be replaced with TWO good ones, at NO CHARGE to you.

GALT BRASS COMPANY, Limited

GALT, ONTARIO

COMMUNITY OR INDIVIDUAL ADVERTISING

The difference between community and individual advertising is that the first creates a general demand for Plumbing goods and establishes a market where the product can be sold, while the other simply draws attention to the individual article manufactured by the advertiser.

When that article is an entity in itself and can be used independently and not necessarily in conjunction with other fittings, individual advertising is good, but where the article manufactured is only a part of general equipment and can only be used in conjunction with several other fittings in order to make a perfect installation, then, in the opinion of the writer, community advertising is productive of better results.

The PORT HOPE SANITARY MANUFACTURING COMPANY, LIMITED, make Plumbers' fine enamelware, but without cast iron soil pipe, brass work or other fittings it has no material value, and while it is quite possible that by advertising enamelware exclusively we might be able to interest a number of people and direct their attention to its good qualities, and after an examination have it exclusively used in the work in which they are interested, community advertising, however, would go much further and would interest the public at large in all Plumbing material, whether it consisted of Soil Pipe, Plumbing Fixtures, or Brass Work, and at the same time create a greater demand for enamelware. It would also take into consideration water supplies and sewage disposal, and the result would be that the entire population in the field covered would have a better understanding of Plumbing work, its uses, advantages and value.

A wider distribution of Plumbing material would mean a larger field for the Manufacturer, Jobber and Contractor, and with a larger field more material would be used and there would be more business for everyone.

The foregoing is offered as a statement of the position the writer has taken in discussing this question on several occasions, and it expresses his views on the subject of advertising. Does it appeal to you? If it does, will you help? Talk it over with your jobber or his traveller, or write this office. Now is the time to start advertising propaganda. It's bound to be successful.

Port Hope Sanitary Mfg. Company, Limited

Factory:
PORT HOPE, ONTARIO

Head Office:
ROYAL BANK BUILDING, TORONTO

TORONTO SHOWROOMS
119 King St. East

WINNIPEG OFFICE
405 Tribune Bldg.

MONTREAL SHOWROOMS
234 Beaver Hall Hill

HALIFAX OFFICE: McCurdy Building, Hollis Street.

Established 1907 Circulates Throughout Canada

Sanitary Engineer
Plumber and Steamfitter of Canada

Published First and Fifteenth of Month

Vol. XIII TORONTO, APRIL 1, 1919 No. 7

The "What," the "Why" and the "How" of the B.T.U.

Written for "SANITARY ENGINEER" by N. A. KEARNS

No. I of a Series

Editor's Note.—This article is the first of a series prepared especially for the readers of the SANITARY ENGINEER, covering heating and engineering practice reduced to its simplest terms. Descriptions of installations made in different classes of buildings will be given, together with the method used in making the designs for these installations. It is not our purpose to give complicated formulas, but rather to present the simple rules that have been based on these formulas, in such a way that the reader will be enabled to design a heating and ventilating system without having to refer to the data given in engineer's hand books. The author of these articles, Mr. N. A. Kearns, has designed heating and ventilating equipment for all classes of buildings in practically every province of the Dominion. Some of the buildings were such that the heating and ventilating equipment had to be installed under the most adverse conditions, whereas in other buildings the design for the heating and ventilating equipment was incorporated in the constructional drawings. The second article of the series will appear in next issue.

SEVERAL years ago the writer was asked by a foreman steamfitter how calculations were made in determining the amount of radiating surface necessary to heat air in ventilating work. When I attempted to describe how this depended to a great extent on the nature of the installation, and endeavored, by means of a formula to make my meaning clear, he expressed the opinion that there surely was some average condition for which a rule could be made so that with this rule and a measure of common sense any fitter might estimate how much indirect radiation he should instal under any set of conditions. He said that while my formula might be clear enough to one conversant with its use, that it was anything but clear to him. In subsequent conversation with this party, I learned that he, in common with scores of other men in a like position, had made an attempt to read some of the works on heating and ventilation, but that he had given it up as a bad job on account of the "pollywogs" appearing in the formulas.

Many expert journeymen fitters will not take the time to learn the principle on which the formulas are based, and it is for these men that this and the following articles are written in the ordinary everyday language of the practical man. Perhaps in the later and more advanced articles it may be necessary to use engineering formulas. But the reader can be assured that the rules will be explained in such a manner that no knowledge of advanced mathematics will be required. So many satisfactory heating installations have been made by men of limited education that it might be argued that the intricate calculations found in engineers' handbooks are unnecessary. The answer might be made that the experienced man has a thorough understanding of the principles of these formulas and may use them everyday in his practice although he may be unconscious of doing so.

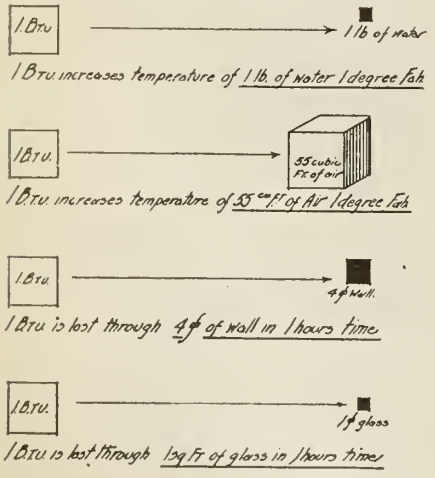
If one has a grasp of the principles used in designing any kind of work he will have no great difficulty in arranging the details. So the first thing we will try to get together on is the principles, and afterwards it will be our endeavor to describe some of the details used in the installations of various systems of heating.

Now there is one factor that we cannot pass up, and that is the measurement of the quantity of heat in any substance. With the knowledge of how much heat is required to offset any heat loss, together with the knowledge of where we can best get that required heat, we are in a fair way to design a heating system.

There is a certain measurement of heat that we term the British thermal unit (B.t.u.). This, roughly, is the quantity of heat required to raise one pound of water one degree Fahr. For illustration we will take a vessel containing exactly one pound of water, measuring the temperature of the water by means of a Fahrenheit thermometer. We will then take a small piece of iron and heat it in a fire. If this is a very small piece of iron we may heat it to a very high temperature—perhaps until it is red hot. While it is still hot we drop it into the vessel containing the water, being careful to see that we do not let any of the water escape either in the form of steam or otherwise. When the piece of iron has cooled to the same temperature as the water we take the temperature of the water by means of the thermometer and find that the pound of water has increased by just the amount of heat that was contained in the iron. Now that water has not increased to the same temperature as the iron when taken from the fire. If the iron was red hot we may assume that its temperature was about 900 deg. Fahr. and we may find that the water has just increased in temperature by 3 deg. Fahr. So now we know that a thermometer does not indicate the

quantity of heat but rather indicates what is termed as "sensible heat." You could not put your hand to that red hot iron without some discomfort, but after the iron had passed off all the heat that it got from the fire to the water you find that, although there is just as much heat in the water as there was in the iron, you are not able, by the feel of the hand, to distinguish any great difference in the temperature of the water and the temperature of the surrounding air. So temperature and heat are not the same things. We will measure our quantity of heat by the British thermal unit, and, knowing that one pound of water has increased in temperature by three degrees we can readily understand that there was just 3 B.t.u.'s in that piece of red-hot iron. If, instead of putting the iron in the water we had left that iron exposed to the air after we removed it from the fire, it would have heated 55 cubic feet of air 3 degrees in one hour, providing that there was no loss of heat from that 55 cubic feet of air to the surrounding atmosphere. Or again, if we had a brick wall, lathed and plastered, such as found in the ordinary residence, and we had placed that iron close to that wall in such a way that there could only be a heat loss through the wall, we would find that in one hour we would have cooled that iron to the normal temperature, that is, if we had just 12 square feet of wall to work on. Then again we might have a sheet of window glass, and if we placed the iron close to the window glass in the same way as we exposed it to the wall surface we would find that we had cooled our iron to the normal temperature, providing we had just three square feet of window surface to work on.

From our experiments we have come to the knowledge that it takes just as much heat to raise one pound of water one degree in temperature as it does to heat 55 cubic feet of air, and that the loss of heat through a square foot of the ordinary residence wall is just one quarter of this in one hour's time, or that the loss through one square foot of window glass is one B.t.u. in one hour. So we make a diagram like this:


1 Btu
1 lb of water
1 Btu increases temperature of 1 lb. of water 1 degree Fah
1 Btu
55 cubic Ft of air
1 Btu increases temperature of 55 cu ft of Air 1 degree Fah
1 Btu
4 sq ft wall
1 Btu is lost through 4 sq ft of wall in 1 hours time
1 Btu.
1 sq ft glass
1 Btu is lost through 1 sq ft of glass in 1 hours time

Now we have our proportions to work from.

If we always keep in mind that one B.t.u. will raise one pound of water one degree Fahr., it will be a very easy matter to figure the amount of heat required to raise the temperature of any substance one degree when we know how much more or less heat that substance requires than a like quantity of water.

The iron, when we put it in the fire, was just at the normal temperature of the room. It had no heat in itself to impart to its surroundings, but when it came in contact with the heat of the burning fuel it took up a certain amount of the heat that was being freed from the fuel by combustion and transferred it to the water or to its surroundings, as our experiments demonstrated. We could have heated the water with less waste of energy and heat had we placed the vessel containing the water right over the fire, thus demonstrating that all methods of transference of heat do not give like results. We must allow a factor for waste.

Fuels have different proportions of heat. Some fuels have more heat than others, but some fuels containing a great deal of heat can only be burned so slowly that they do not give up their heat with the same rapidity as fuels having much less value For instance, wood that liberates its heat very freely will cause a boiler to steam very much faster than coal that contains a great deal more heat, but that does not give up that heat so quickly.

The value of fuels are generally taken as follows:

	B.t.u.
1 lb. anthracite coal	14,500
1 lb. soft coal	11,600
1 lb. Connellsville coke	11,600
1 lb. charcoal	13,920
One cubic foot of gas	600
Electricity, 1 kilowatt hour	3,400

It must be borne in mind that there is no type of heating apparatus made that takes all the heat in the fuel and transfers it to the heating medium without loss. Very few heating boilers waste less than 40 per cent. of the fuel, so that in estimating the amount of heat that we get out of a pound of anthracite coal we usually figure on 8,700 B.t.u. per pound instead of the 14,500 that we might, were we sure of getting all of the heat stored in our coal bins.

The second article of the series will appear in the next issue and will describe the different rules used in calculating the quantity of heat required for different types of installations, together with a description of the nature of the apparatus used in supplying the heat.

VENTILATING THE MODERN SCHOOL

Written for "Sanitary Engineer" by N. A. KEARNS

AS THE community spirit becomes more general there is an increasing demand for the "consolidated school."

The consolidated school, as a building, is frequently superior in the way of heating and ventilating equipment to many of the schools in cities. These consolidated schools are, as a usual thing, built by men that have intense interest in the education of their children, and as a result the school boards are prepared to go their limit in providing schools that in every respect are of a very high standard.

The heating engineers in the small towns and villages are often passed over and their branch of the work given to "some firm from the city." This is probably because the board feels that the man from the city may be better fitted to do this work than the man with the shop in the nearest town.

It is not the heating part of it wherein they doubt his ability. They also know that he does sheet metal work; but when they ask him about the ventilating part of the business he generally admits that he knows nothing about it. So the board employs the other man.

It is no use to say that ventilating work is not a part of the heating engineer's business, and that it should be left entirely in the hands of the sheet metal workers. Sheet metal work is a very important part of many ventilating systems, but at that there are many ventilating plants in operation where the amount spent on sheet metal work was almost nothing. And even though the actual work in running the ducts may be the metal workers' the responsibility for the working of the plant is the heating engineer's.

The workman that knows why he is doing a thing takes more interest in his work than he who works in the dark. And when one forms a mental picture of what he is to do, his understanding of the work cannot but be an inspiration to him.

You may not secure the big work even though you are familiar with all the branches of your trade, but you have the satisfaction of knowing that you could have done the work had you secured it. The chances are that if you show the people in your community that you know your business, you will get the work to do.

There is nothing mysterious about ventilating systems. Their principles are easier to grasp than are the principles of heating, and any one with some knowledge of the heating business can in a very short time secure a great deal of valuable information about ventilating systems with very little effort.

The different systems described here are systems that have been tried out on more than one school. Some of these buildings the writer designed completely, working the ventilating system

(Continued on page 28)

Ontario Housing Act Passed

Many Regulations Included in Act Will Prove of Interest to the Trade—Certain Standards Specified—Only British Subjects Allowed to Participate

Editor's Note.—The accompanying article gives in condensed form provisions of the Ontario Housing Act, assented to on March 20. Various provisions of the Act will prove of great interest to the trade. We would be glad to have expressions of approval or criticism from members of the trade, for publication in next issue of the SANITARY ENGINEER. There are always divergent views on a subject of this kind, and an expression of opinion from practical men in the trade will be welcomed.

THE Ontario Housing Act passed its three readings during February and March and received the assent of the Lieutenant-Governor on March 20.

The Act empowers the Province to borrow money at 5 per cent. interest for twenty years from the Dominion Government, and from other persons for the same term, at such rates as may be fixed by the Lieutenant-Governor-in-Council for the purpose of lending to a municipality to provide funds for the erection of workingmen's homes.

Each city borrowing from the Province must pass a by-law empowering its council to borrow and appointing a commission to administer the loan and may limit the powers of its commission further than is done by this Act by a civic by-law if it so desire.

In a municipality of less than 100,000, the commission is to consist of the head of the council for the time being as chairman, and two or four others, not members of the council, who hold office for two years, retiring in rotation.

In a place of 100,000 the commission is to consist of five members who are appointed for five years and are to retire in rotation. The chairman is to be elected from their number.

Only British Subjects

The commission may acquire land either by expropriation or purchase within its municipality, and may lend to any company for the purpose of erecting workingmen's houses on it, or to any workingman who wishes to erect his own home. Returned soldiers and their families are to have first claim, and only British subjects may purchase at all. Those who have land of their own and wish to build on it may also be accommodated out of the funds.

To Be Paid in 20 Years

The houses are to be paid for over a term of twenty years and are to cost the purchaser the actual cost of the house plus interest at 5 per cent. for that term. Payments are to be made monthly and until their completion the purchaser shall be deemed to be a tenant, thus giving the Government all the remedies of the Landlord and Tenant Act. If the purchaser comes into default of interest he is charged 5 per cent on all payments in default and if the default continues for three months the agreement may be cancelled. The purchaser is to keep the house in repair, pay the taxes, local improvement rates and insurance.

The houses are not to exceed $2,500 in cost, but a commission may in certain circumstances allow $3,000. Houses and land together shall not exceed $3,000, but in special circumstances as much as $3,600 may be spent.

Standards Specified

The houses must be built subject to the following housing standards, according to the working of the Act:—

(A) A water closet, while not insisted on, is preferred. Any other sanitary closet may be used.

(B) No building may occupy more than 50 per cent. of its lots and where possible there must be fifty clear feet at the rear of the lot.

(C) There must be as much clear space between houses as conditions will permit.

(D) Ventilation of portions of open sloping ceilings into roof space will not be insisted on. Insulation of sloping ceilings and flat roofs may be accepted instead.

(E) It will not be insisted upon that plumbing fixtures should be of enamelled iron. Vitrified porcelain may be used. Also laundry tubs of colonial ware (glazed pottery).

The site of the houses must be planned to insure proper sanitary conditions and wholesome environment. As far as practicable each group of dwellings is to be provided with a playground.

All houses must be provided with proper means of drainage and of sewage disposal. An adequate supply of pure water must also be provided. If the houses are in the city this water must be provided from the city mains and if out of the reach of civic water mains, then from wells. In case wells are used, every precaution must be taken to insure that the water is not contaminated. If a septic tank is used in sewage disposal it must be placed so as not to be in any danger of contaminating the well.

All houses in cities must face on a street or boulevard which shall give a convenient dry means of access. In no case shall they face on a lane or alley.

No buildings shall be erected on a site which has not been properly drained of surface water, or on which there is any material impregnated with faecal matter or animal or vegetable decay until such matter has been removed and the ground surface beneath the house filled in with concrete.

In municipalities where there is a building by-law the provisions of this by-law have to be fulfilled except that the minimum standard of the Housing Act will be insisted on.

Farmers may also take advantage of this Act to build a house for their own occupation. They will be subject to all the regulations and must give a mortgage on their entire farm for the cost of the house except that in some cases a mortgage on part of the farm only will be insisted upon.

The Delegate from Ireland sends his card.

HUGE TOLL TAKEN BY GERMAN SUBS

Submarine sinkings during the war amounted to $7,773,584,458, and the number of ships sunk, 5,000. These figures were compiled by Rudder of New York and are based on the British Admiralty records, Lloyds' reports and the United States Shipping Board. Loss of life is estimated at 26,000. The financial loss equals the normal loss of 30 years.

Trade in all lines in Canada is about normal with a little improvement in wholesale, while the retail trade is reported the same, except for a slight improvement in the West.

Vice-Pres. Issues Call to Plumbers

J. E. Walsh, of Montreal, Provincial Vice-President of Canadian Society Domestic, Sanitary and Heating Engineers, Urges Plumbers to Take Greater Interest in Trade By Joining Local Organization or Assisting in Formation of One

AS war with its dreadful and agonizing consequences called forth new conditions which had to be overcome with stern and even revolutionary methods, peace, with its welcome and blessed opportunities, calls for alike new conditions which nations must be equally ready to control with well-considered and strenuous action.

A clarion call has been heard throughout the entire world, imperatively demanding that immediate steps be taken to provide for demobilization.

Canada, unprepared for war, surmounted every obstacle, and now, with the early advent of peace, Canada is striving with equal vigor to grasp every opportunity. Reconstruction and readjustment are her watch-words. Every individual, every corporation is asked to contribute to the success of the whole nation. Manufacturers, suppliers of materials, builders' exchanges and other trade associations are being reconstructed and readjusted. Concerted action is replacing individual effort; organization and co-operation, so essential to success, have come, it is hoped, to remain. Efficiency for the general good is the ultimate object.

An Important Opportunity

The natural question then arises: What are sanitary and heating engineers doing to further the cause of demobilization? Are they, like other associations, strengthening their ranks and preparing themselves to take their proper places in the universal reconstruction? The question must be answered by the individual. Are you a member of a local organization? Or, if there is no organization in your locality, are you endeavoring to do your share in forming one? If there exists an association in your city or town, do you not feel that the present demands for co-operation leave you no choice but to seek membership? And if an association does not exist in your neighborhood, do you not realize that you must organize, that you must become willing, even anxious to co-operate with your confreres in forming one? In either case the remedy is simple.

This May Help You

In the largest cities of every Province there are sanitary and heating associations, whose members are only too pleased to add to their numbers, as well as to assist smaller cities and towns in forming similar organizations. Some Provinces, moreover, are fully organized as Provinces. Ontario and Saskatchewan are the leaders in that respect and their members openly acknowledge that, to their organizations, they owe the prosperity and efficiency of their trades. The city of Toronto, in the opinion of many, boasts the most thoroughly organized and modernized society. Its genial and energetic secretary, Mr. Garrett Frankland, makes it both a pleasure and a duty to extend to fellow craftsmen of other Provinces the benefits of his experience, and is at all times prepared to supply them with any literature or advice tending to encourage and assist in the establishment of locals.

J. E. Walsh

The city of Montreal has, likewise, a splendid association, whose president, Mr. T. Latourelle, and secretary, Mr. John A. Gordon, are only too happy to be of assistance to the sanitary and heating engineers of other towns and cities.

Quebec Needs Organization

But the Province of Quebec, unfortunately, is not so well organized as some of the sister Provinces, and it is therefore to Quebec that this article is principally addressed. Associations are needed in all the cities, principally in Quebec, Three Rivers, Hull and Sherbrooke. All other towns, where possible, are also invited to form separate locals, and then affiliate with the parent body as the Canadian Society of Domestic Sanitary and Heating Engineers. The expense of membership in the Canadian society is purely nominal, the per capita tax for this year being only one dollar. Mr. John Watson, 4145 St. Catherine street, Westmount, is the Canadian secretary, to whom you should apply for application forms and other information. Always remember, that if it is impossible to form an association in your own town, you can secure membership, as an individual, in the Canadian society by simply applying on your business letter to Mr. Watson.

The 1919 Convention

This year the Canadian society will hold its regular convention in Montreal, on June 3rd and 4th. The president, Mr. Alex. Charette, of 414 Ontario street east, Montreal, extends a most cordial invitation to every sanitary and heating engineer of the Dominion to be present. He expects the Province of Quebec to have representation fully as numerous as the English-speaking Provinces, and with this object in view emphasizes the invitation to his French-speaking confreres. To them, and especially to non-members, he wishes explained that the parent body is bi-lingual, and that the discussions are carried on in both French and English languages.

This year the president of the Montreal and also of the Canadian associations are both French Canadians. Is it, then, too much to ask that all our craftsmen of French descent make a special effort to show their appreciation of the honor conferred on their race in the appointment of these gentlemen by an English-speaking majority?

Each Man's Duty Plain

At every convention, matters of vital interest are discussed from the viewpoint of the public and the sanitary engineer. This year, with its abundance of new problems, the convention will, of necessity, be more interesting and instructive than ever, so it behooves all sanitary and heating engineers, members and non-members, to make immediate arrangements, so that nothing will prevent their attendance in Montreal on June 3rd and 4th next.

Yours very truly,

(Sgd.) J. E. Walsh.

DEPARTMENT STORE DELIVERS GOODS BY AIRPLANE

What is described as being the first load of merchandise ever delivered by airplane from a department store to a customer was sent last week by Lord & Taylor of New York to a suburban customer. The shipment consisted of a bungalow bed, floor lamp, fireless cooker, three pillows, two dozen linen napkins, two table cloths, a dozen Turkish towels, one taboret, one carpet sweeper, one percolator, and a 9 x 12 rug.

A duplicate shipment, together with airplane engine, displayed in Lord & Taylor's store on Fifth Avenue, drew crowds of curious shoppers.

Be a Booster for the Convention

THE next convention of the Canadian Society of Domestic Sanitary and Heating Engineers will be held on June 3 and 4, in the Caledonian Club Rooms, 101 Burnside Place, Montreal. The executive committee will meet at 9 o'clock on June 3, and the regular session will be called at 2 p.m. the same day. New by-laws have been printed and are now up-to-date, with all amendments made at the London convention included. All those interested in the trade and wishing to secure copy of the new by-laws will receive same by applying to Mr. John Watson, sec.-treas., 4145 St. Catherine St., Westmount, Montreal. The sec.-treas. has recently sent out a letter to members of the society as follows:—

"We take the liberty of writing you on a subject which is most vital to our trade and calling, and would ask you to read this letter and consider if it would be advantageous to you to be one of our number. The objects of the Canadian Society of Domestic Sanitary and Heating Engineers are as follows:—

"This society is organized for sanitary heating, commercial and social purposes, and has for its special object the advancement of trade in all its latest discoveries of science appertaining to sanitary heating laws; to promote and combine the interests and influence of members for the protection of trade against imposition, injustice or encroachment upon our common rights and interests, encouraging inventions and improvements in sanitary appliances fostering an interchange of thought, and electing and communicating for the benefit of every member the best talent and the result of the experience and ability of all; to promote amicable relations with employees on the basis of mutual interest and equitable justice to both journeymen and master plumbers; to encourage Dominion and Provincial legislation for the interest of sanitary laws; to secure for the members of the trade equitable treatment in their dealings with manufacturers and dealers in supplies; to regulate the system of apprenticeship and employment, so as to prevent as far as practicable the evil growing out of deficient training in the responsible duties of selecting, arranging and fitting up materials relating to the hydraulic and sanitary heating conditions of dwellings, public and private institutions; to create and maintain a sanitary code in as high a standard as the progress of science (chemical, philosophical and mechanical knowledge) teaches, and we agree to carry forward with tireless zeal the work to which the foregoing statements relate.

"We are holding our Annual Convention in Montreal on the 3rd and 4th of June and would be pleased to have any of our craft who are legitimately carrying on the business of plumbing and heating at this meeting. We would much prefer that you establish a society in your city or town and then send some delegates to the convention, but if preferred any individual can join up with our society at a cost of one dollar for this year, all that is required is a letter from you on your letterhead paper making application for membership. We will then send you a copy of our by-laws and if you approve of our method of doing business the cost of same will be one dollar per member which pays your capitation tax up to the Annual Convention. Hoping you will seriously consider this matter as it is of vital importance to all in our business,

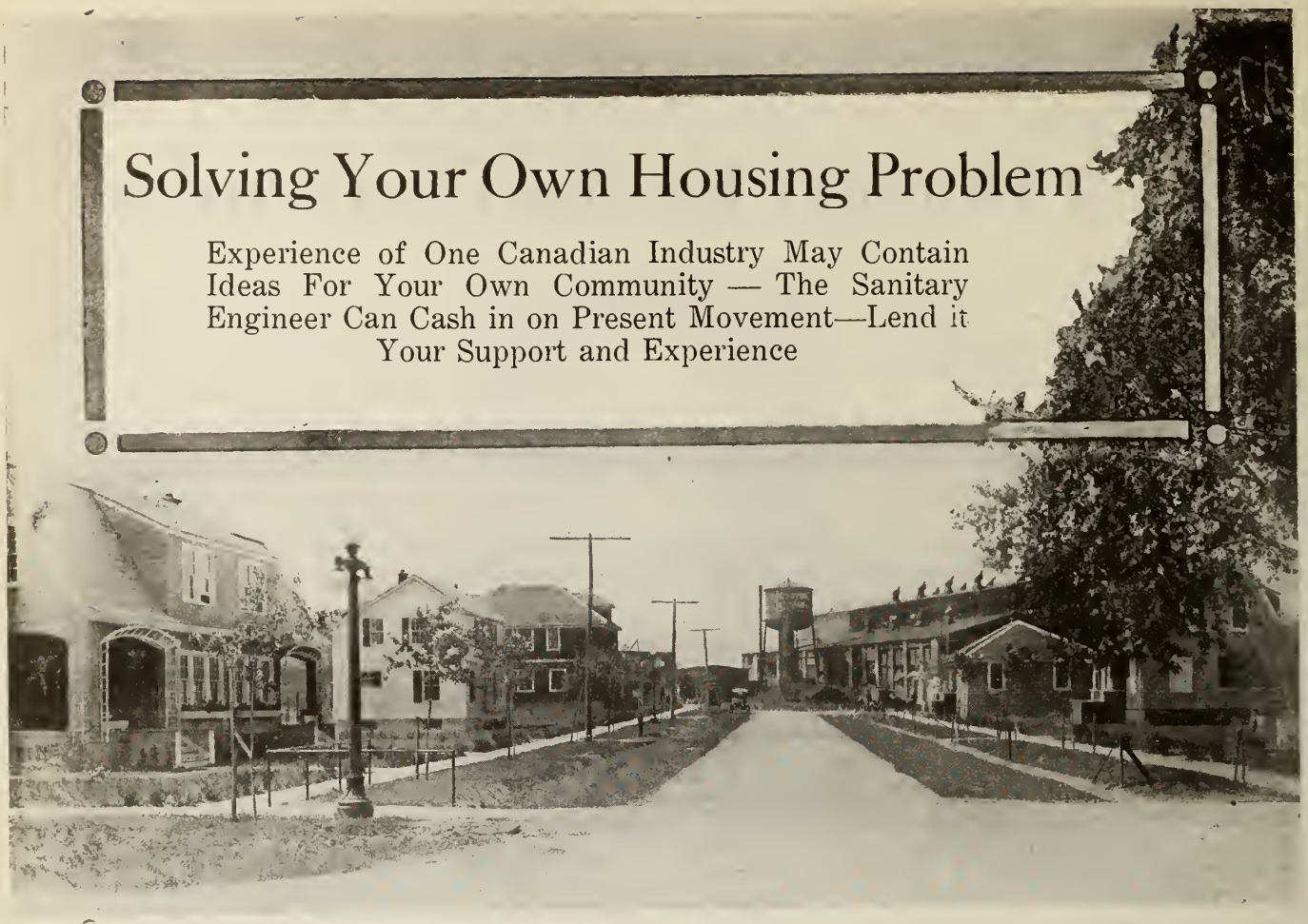
Yours truly,

JOHN WATSON,
Secretary."

The foregoing letter from the secretary outlines concisely the aims and objects of the association. The advantage of men in the same section of trade getting together, meeting one another, and talking over matters of mutual interest, cannot be over-estimated. It engenders a spirit of co-operation throughout the whole trade, which makes for better conditions and better business. The effects are not only immediate, but permanent. It is something like dropping a stone in a pond. The circle is ever-widening, and in this case it is an ever-widening circle for the good of the trade. While good results immediately from gatherings such as will be held in Montreal, the benefits are spread over months or even years.

Solving Your Own Housing Problem

Experience of One Canadian Industry May Contain Ideas For Your Own Community — The Sanitary Engineer Can Cash in on Present Movement—Lend it Your Support and Experience



THE Housing Problem is not confined by any means to the larger cities, but is a vital question in practically every town in the country. The idea of this article is to show the steps taken by one industrial firm to solve their own employees' problems in this respect and perhaps suggest something which the local merchants can bring to the attention of their local town council or local firms as a suggestion for their activities during the present year. It is not too early to "start the ball rolling" and the sanitary engineer stands to benefit by lending his support and influence to any housing scheme which may be instituted in his own community.—EDITOR'S NOTE.

THE housing of the workman is receiving a large amount of attention, and justly so, for the industrial developments of the last few years have to a large extent altered conditions formerly encountered. Many industries have sprung up in districts remote from large centres, and even the cities themselves have felt the pressure incidental to the increased numbers of workers in the munition plants, which have been operating in such large numbers. The Governments of many of the Allied countries have taken considerable interest in this phase of labor problem, and many firms have themselves gone to considerable expense to create satisfactory conditions for their employees.

One of the most interesting of these private housing schemes has been worked out by the Norton Company, both in Canada and in the United States. In this article the industrial community created by the Norton Company shows the developments which have recently been completed at Chippewa, where the Canadian plant of this company is located. There may be some feature of particular interest which can be adapted to your own community and the sanitary engineer is one who is sure to benefit in proportion to the interest he shows in the present housing problems of his town.

The location of the Norton Co. at Chippewa, Ont., while ideal from the standpoint of power supply and industrial facilities, was somewhat at a disadvantage as regards housing conditions for employees. Houses were scarce and unsatisfactory, and rents were high, necessitating the employees living at Niagara Falls and coming to work by street car, the night shift having a car service at only one hour intervals.

To ameliorate these conditions the company started a comprehensive housing scheme in 1916, the major portion of which has recently been completed. Land, which was formerly a cow pasture and swamp, is now filled in, graded, with well built roads and lighting, and forms the nucleus of an exceedingly attractive community. How many towns have these "beauty" spots that are an eyesore to the residents and create a poor impression on the visitor?

Layout

The community is located somewhat to the south of the plant and centres around a new cross street, which intersects the main approach to it.

This street, together with that leading to the plant, has been graded, paved, sidewalks put down and made attractive by the planting of trees and the wise utilization of those already grown to full size. An additional pavement has also been put down for the space of several blocks to provide a satisfactory means of entrance from the village of Chippewa proper.

The types of houses developed by the architects, Wright and Kremers, of Niagara Falls, N.Y., are vastly different from those usually met with in industrial communities. All too frequently in new developments one sees block after block of houses the same in every respect, closely jammed together and with no attempt made to relieve the monotony by varying the architectural features of individual houses, if, indeed, they have any.

In the development here described, the value of plenty of yard space for each

unit was well considered. Each house, or double house, is set well back from the road, with an ample back-yard, and a uniform street line has been carefully avoided. In a typical block the central feature will be found to be a double house of substantial appearance, set well back from the road. On each side of it the houses approach the road more nearly, the corner houses of each block being the nearest to the street line. The houses are symmetrically disposed as regards their type on each side of the central feature, or double house, and while this is done, the exterior features are arranged in such a manner that no appearance of similarity exists. One house may have shingled walls, and its counterpart in plan will be given an entirely different appearance by the use of clapboard siding, and a different verandah treatment.

The Vanished Backyard Fence

That eyesore of the city and town, the backyard fence, is only conspicuous by its absence, and the hedges, which have been planted in its stead, will, with each passing year, grow more attractive and will make the backyard a place of beauty, instead of a depository for ashes and tin cans.

Along with this improvement goes one which also helps towards the attractive appearance of the community. No one will admit that the twice a week appearance of ash and garbage cans on front lawns is an aid to civic beauty. This has been avoided in the present instance by the provision of a through lane, serving every house in a block. Through this lane all coal is delivered and all garbage collected. The garbage cans are chained to posts so that their removal is a matter of some difficulty.

Sanitary Provisions

Since the Village of Chippewa has no sewage or water systems, the company have considered it good policy to provide both for the community which they have established. Every house is connected to the sewage system, or rather to two systems, for the rain-water collected from the roofs is drained into a separate sewer, which also takes the waste water from the plant. The sewage in a separate system is taken care of by a septic tank before being discharged into the river. The separation of storm water from sewage relieves the septic tank from the excess water and allows it to function properly.

The water system, which supplies both the plant and the private houses, draws its supply from the Welland River. A duplicate chlorinating plant is installed, a vital necessity when it is considered that even "the bright, sparkling well water" of the village was highly contaminated with organic matter and at times a dangerous source of typhoid.

The chlorination of all water used in both the private houses and the plant removes the possibility of infection from this source.

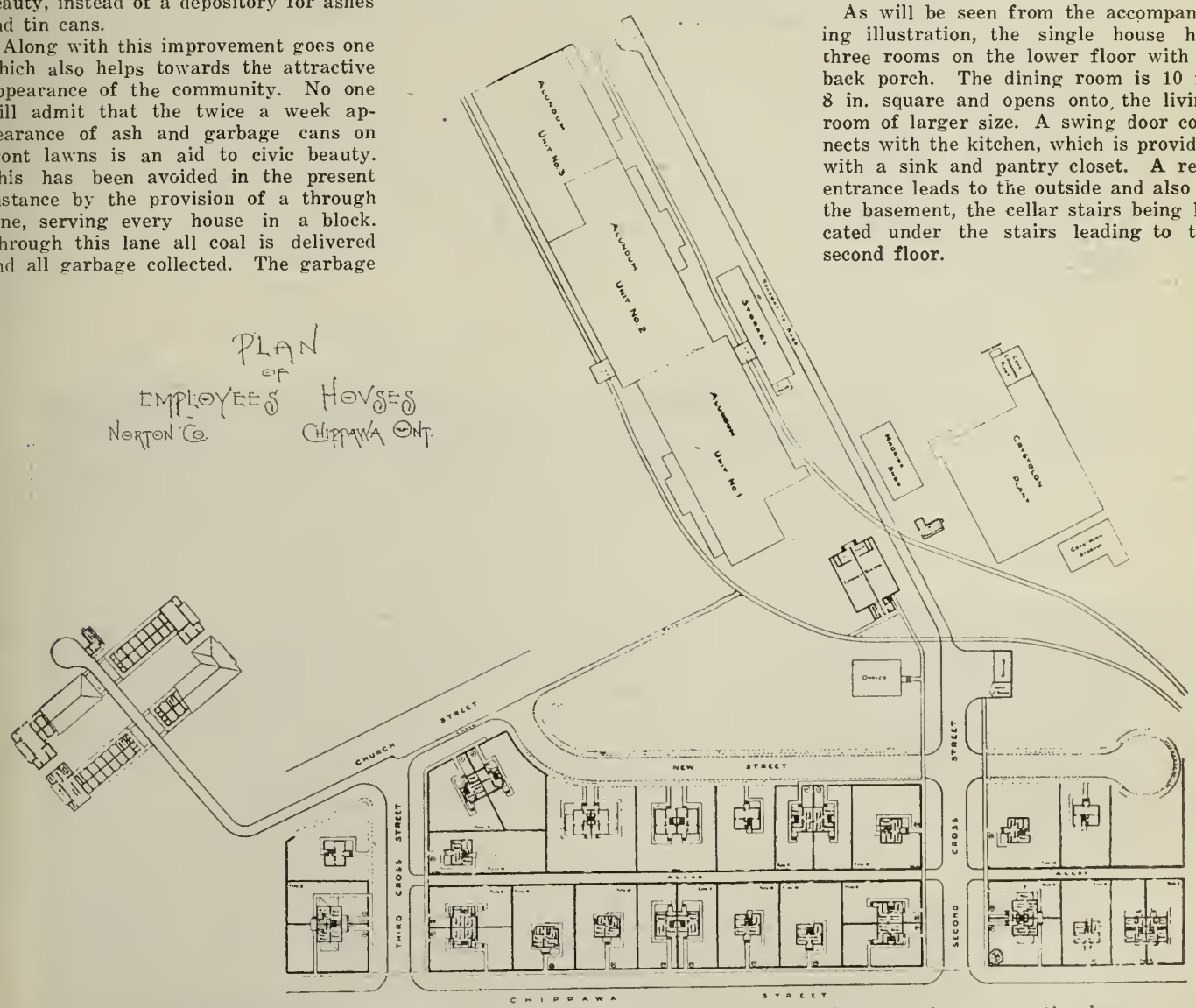
Fire Protection

For the protection of plant and community from a fire, a fire department has been organized with hydrants located at proper distances apart. Two volunteer fire companies have been organized and are provided with a hose reel and a chemical wagon, housed in an attractive station. Fire alarm boxes of the break glass type are located on the ornamental lamp posts. These boxes serve to operate an indicator in the fire hall, and also operate an electric siren at the plant. This signal gives the operator at the pump house notice to boost the pressure.

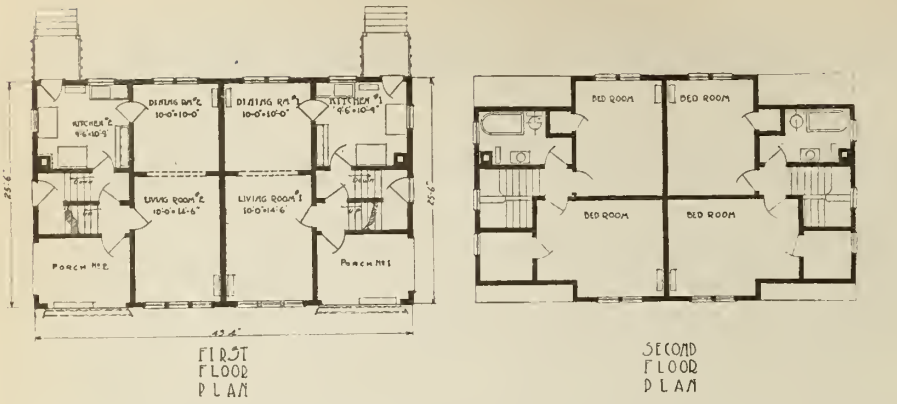
Too many towns to-day neglect to have a proper fire protection system. Hundreds and thousands of dollars could be saved were better fire fighting apparatus available. The saving in insurance rates covers the cost of proper equipment to fight this dreaded menace.

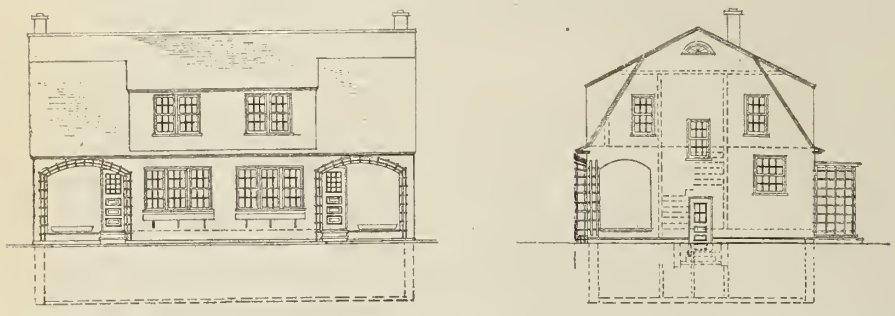
Plan Arrangement of Houses

As will be seen from the accompanying illustration, the single house has three rooms on the lower floor with a back porch. The dining room is 10 ft. 8 in. square and opens onto the living room of larger size. A swing door connects with the kitchen, which is provided with a sink and pantry closet. A rear entrance leads to the outside and also to the basement, the cellar stairs being located under the stairs leading to the second floor.



Plans for housing development at the Chippewa plant of the Norton Co. There may be a suggestion here for beautifying some unsightly part of your own community.





Plan and elevations of the typical double house . Many builders favor this Type and it has advantages.

The second floor contains three good-sized bedrooms and bath, closet space being provided for each room.

The double houses are arranged on a slightly different plan, the stairs leading to the second floor from a small hall, instead of directly through the living room. A front porch is also provided, instead of one off the living room. The kitchen is directly off the hall and opens into the dining room through a swing door. The bedrooms upstairs are only two in number, but are of generous size.

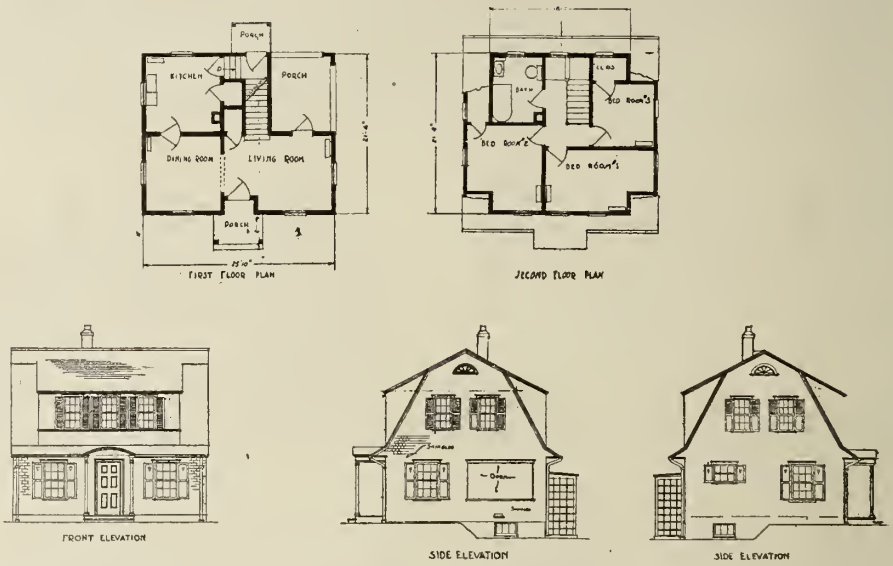
The double house admits of slight variation in plan, several different arrangements being used. All the houses are heated by hot air, and all are provided with conveniences and electric light. Their popularity with the working staff is such that there is a waiting list for houses, which from time to time are vacated.

In order to make provision for those employees who are unmarried the company found it necessary to take over the old Baltimore house in Chippewa, a frame building which has existed for a good many years, for almost a century in fact. The interior of this building was completely remodelled, a new veranda built and other alterations made, which resulted in a very comfortable home for employees who wished to take advantage of it.

The housing problem is a real one today and, by giving it all the encouragement possible the trade stands to benefit by the sale of merchandise and—not the least point to be considered—a better community to serve.

CITY BUILT OF ZINC

Bareira, in Portuguese East Africa, is the only zinc city in existence. Zinc is the only material capable of withstanding the peculiar climate. It took some thousands of people who make up the population only six months to build the place. Hospital, church, arsenal, and every dwelling is of zinc; and even most of the railway cars are zinc throughout.



Plan and elevations of typical single ho use. There may be an idea here for your own community builders.

View showing typical houses, Norton D evelopment Co., Chippewa. This class o f house is a credit in any town or city. Making this old world a better place t o live in is not such a bad idea.

Warns Prospective Purchasers to Watch Terms of Bulk Sales Act

H. G. KELLY, Toronto manager of R. G. Dun & Co., in a recent interview pointed out the necessity of added care in operations pertaining to the purchase of stores in Ontario—owing to the operations of the Bulk Sales Act that has recently come into force.

"It is possible," he said, "that many returned soldiers will, within the next few years, engage in business on their own account, in many cases buying out established ventures. It is to be feared that some of these transfers, particularly of small businesses, etc., will be made in a more or less informal manner.

"It would be a great pity if any of these returned men, through not understanding legislation which has occurred in their absence, should lose their savings. I refer particularly to the Bulk Sales Act now in force in this Province.

"I have knowledge of several instances which have already occurred, where the transfer has been made without the knowledge of or attention to the provisions covering bulk sales of merchandise stocks. It is to be hoped that purchasers will protect themselves in these transactions, with good legal advice and guidance, which should be their only proper course."

Operations of Bulk Sales Act

Under the Bulk Sales Act, it is the duty of every person who buys any stock in bulk, for cash, or on credit, before closing the purchase, and before paying any part of the price in excess of $50, before giving any note or security for the price to demand and receive from the vendor a written statement verified by a statutory declaration of the vendor, containing the names and addresses of all the creditors of the vendor, and the amounts of the indebtedness or liability due and payable by the vendor to each of the creditors. If there be a failure to obtain the statement, the sale is deemed to be fraudulent and is void as against the creditors, unless all the creditors are paid in full out of the proceeds of the sale. The purchaser, upon obtaining the statement, shall either obtain a written waiver from the creditors of the vendor, or shall pay the whole of the purchase price, or deliver his notes or other documents securing the price into the hands of a trustee for distribution pro rata among the creditors of the vendor, subject to any preferences provided by law or by previous contract.

If the purchaser shall fail to observe the requirements in respect to the trusteeship, without obtaining the written waiver of the creditors, the sale is deemed fraudulent and is void as against the creditors of the vendor, unless all the creditors are paid in full out of the proceeds of the sale. Any sale or transfer of stock, or part thereof, out of the usual course of business or trade of the vendor, or whenever substantially the entire stock of the vendor is sold, or whenever an interest in the business or trade of the vendor is sold, or conveyed, the sale, transfer or conveyance is deemed "a sale in bulk," within the meaning of the Act. But if the vendor produces and delivers to the vendee a written waiver of the provisions of the Act from his creditors having claims of $50 and over, representing 60 per cent. in number and value of the claims of $50 and over, as shown by the statutory declaration, then the provisions of the Act do not apply.

FRED ARMSTRONG, LIMITED. ASKS FOR FACTS

An appeal that the full facts be brought out at the probe of the accounts of the Board of Education was made by R. S. Robertson, who represents Fred Armstrong, Co., Ltd.

Mr. Robertson explained that his client took the view that only the evidence which was introduced by Shirley Denison, K. C., was before the commission and that other evidence could be produced by the tradesmen concerned in the matters which are under investigation.

Mr. Denison disclaimed any desire to shut out any evidence which anyone desired to lay before the commission. Mr. Justice Lennox ruled that he would make no general decision, but would consider each case on its merits as to whether or not outside counsel and witnesses be admitted.

Current Events in Photograph

AIR DELIVERY OF SOLDIERS' LETTERS

A regular aeroplane service between England and the Army of Occupation in Cologne has been inaugurated by the 120th Squadron of the Royal Air Force. The photo shows a big bag of mail being loaded into one of the high-speed machines at Folkestone. A few hours later the letters will be dropped at Cologne. The tag is enlarged in the photo.

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UNITED STATES—New York, A. R. Lowe, 111 Broadway, N.Y., Telephone Rector 8971; Boston, C. L. Morton, Room 734, Old South Building, Telephone Main 1204. A. H. Byrne, Room 900, Lytton Bldg., 14 E. Jackson Street, Chicago, Telephone Harrison 1147.

Vol. XIII. APRIL 1, 1919 No. 7

AN ENLARGED PROGRAM

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER OF CANADA has practically completed arrangements for a greatly enlarged editorial program. In addition to the many technical articles which have always been a prominent feature of the SANITARY ENGINEER, a considerable amount of space will be given to buying and selling problems; display and advertising methods; business systems; account collecting; cost figuring systems; illustrated articles showing modern display departments of Canadian plumbing shops; illustrated articles on installations; articles on salesmanship, arranging of selling prices, and also a series of splendid articles on merchandising of sanitary, heating, lighting and electrical goods. Special attention will be given to sanitary and heating arrangements of farm homes, housing systems, theatres, schools, hotels, factories, municipal buildings, etc.

An enlarged service will also be given on news of the trade, national and local association news, and business topics and problems of the day. The foregoing are only a few of the editorial features to be included in the editorial department of the SANITARY ENGINEER in future issues. We will always welcome suggestions from readers as to how the paper may be made more valuable.

The first of a new series of articles on heating and ventilating appears in this issue, and in succeeding issues we will have several new and important announcements to make to our readers. Readers will, no doubt, observe several changes in the style of make-up of this issue compared with previous issues, and these are only the first of many changes to be made in our paper. Watch the next issue for some of the most interesting articles you have ever read on subjects in which you are vitally interested.

THE NIGHTMARE OF COMPETITION

THE merchant who listens to the contention of a customer that he can buy certain goods cheaper elsewhere, and thereupon starts out on a campaign to see if he cannot reach bottom quicker than the other fellow, is certainly wanting in a sense of proportion. It is possible that the merchant's price may be too high, but if it is figured on a real understanding of business, this is unlikely. It is possible, too, that the customer is using the same old bait that has been so often used to obtain favored prices. In any event, it is an item of comparatively small moment. The merchant who will spend as much time and energy devising constructive ways of selling his own goods as he does to "meeting competition" will have little competition to meet.

FEATURES OF THIS ISSUE

FIRST article of new series on heating and engineering practice, by N. A. Kearns.

* * *

Details of the Ontario Housing Act which was recently passed.

* * *

Message from Vice-President of Canadian Society Domestic Sanitary and Heating Engineers.

* * *

"Be a Booster." Read the article on the coming convention.

* * *

"Solving Your Housing Problem." Illustrated article giving experience of one Canadian industry.

* * *

Warning re Bulk Sales Act.

* * *

What other members of craft are doing.

* * *

"Master Plumbers Throw the Stanes."

* * *

Details of proposed new Department of Health at Ottawa.

What Others Are Doing

Items of Interest Picked up Here and There Among the Trade—What Members of the Craft Are Doing in Various Parts of Canada.

A. E. Hayman, of Stellarton, Nova Scotia, in addition to featuring his plumbing business, is advertising enamelware, stoves and ranges, washing machines and second-hand stoves.

* * * * *

Livingston & Moodie, of Barrie, Ont., in addition to their plumbing business, are advertising a full line of electric fixtures, bulbs and wire, also an electric steam radiator and vacuum cleaners.

* * * * *

C. R. Hagen, Welland, Ont., who calls himself "The City Plumber," emphasizes in his advertisement that his work is guaranteed and that he will give estimates cheerfully and attend to repair work promptly. The name of T. Harrison as engineer is featured in the advertisement.

* * * * *

B. S. Maltby, Newcastle, N.B., is advertising to his customers that now is the time to get their repair work done before the spring rush commences. Mr. Maltby emphasizes the fact that at the present time he can give prompt service to his customers.

* * * * *

Walker & Halberton, Plumbers and Gasfitters, of Lethbridge, Alta., are advertising estimates on repair work. They announce they can install and fix everything in the plumbing line from cellar to garret, and what is more, can see that the roof does not leak.

* * * * *

Frost Bros., Moose Jaw, Sask., use an illustration in their advertisement showing a plumber at work and announce that they are ready to do promptly plumbing, heating and tinsmithing. They also announce the agency for a furnace which is advertised as gas, smoke and dust proof.

* * * * *

D. N. Flander, of Ingersoll, Ont., in his advertisement asks his customers if they need a new stove or plumbing. Gas ranges are quoted from $22.00 upwards, and a full stock of granite and tinware is referred to in the advertisement. Mr. Flander stated in his advertisement that he will accept bonds in payment of purchases at his shop.

* * * * *

F. C. Kulow, Tinsmithing and Plumbing, Port Colborne, Ont., is using his newspaper advertising at the present time to feature ranges and heaters. He states in his advertisement that many of these ranges have already been installed in kitchens of Port Colborne and ends his advertisement with the question, "How about one for your kitchen?"

* * * * *

D. Howe, successor to Howe & Anderson, Ingersoll, Ont., advertises to the public that when water, steam or gas pipes need repairing or renewing they have simply to call him up and the work will be attended to immediately. Mr. Howe emphasizes the fact that customers should keep the phone number where they can find it instantly and call up his firm when in need of prompt service.

* * * * *

James J. Fitzpatrick, "The Market Square Plumber," at Trenton, Ont., emphasizes the fact that his records prove that all the installations of plumbing and heating which his firm has handled have given entire satisfaction. He further emphasizes the fact that "We are proud of our record, and you can depend upon receiving the same satisfactory service at any time you need it and at sensible prices." The advertisement, while occupying only moderate space, emphasizes in the heading, "Dependable Plumbing and Heating."

* * * * *

Fred Uncles, Plumbing and Heating Contractor, Newcastle, N.B., is making a special feature of the electric fixtures, particularly for store lighting. A well-written advertisement points out the advantages of having good lights in stores and particularly the kind advertised in the advertisement by Mr. Uncles. Ranges, heaters and electric fixtures are also featured in this advertisement. The slogan of this firm is: "You Get Satisfaction and Your Money's Worth When You Buy From Me."

* * * * *

The Simcoe Plumbing and Heating Company of Simcoe, Ont., carried on a clearing sale during March on the ground that they could not get inside help and must devote more time to their shop. The company advertised a great many lines of shelf goods which they wished to dispose of and they also urged their customers to bring along their mail order catalogue and if the mail order price was cheaper than anything which they had in stock they would give the person pointing it out that article free. In their advertisement they emphasized the fact that many of their lines are cheaper at their regular price than the mail order house prices at the supposed cut price.

* * * * *

Yagg, Wilson & Company, Regina, Sask., used considerable space in local newspapers during the farmers' convention which was held in Regina, and featured modern plumbing and hot water heating systems for rural homes. The advertisements were splendidly illustrated, and in one advertisement names were given of forty rural customers who had work done by this company. Yagg, Wilson & Co. suggest that enquiries be made from some of these rural customers and get their opinion of systems which have been installed. Another very attractive advertisement contained two testimonial letters from highly satisfied customers. The advertisements are very attractive and effective and create a splendid impression owing to the many facts outlined in the advertisement and the use of the splendid testimonials from customers who are apparently well satisfied with the work done by this company.

PRACTICAL SHEET-METAL WORK

THREE PIECE ELBOW WITH GUSSET OR GORE PIECE.

BY THOMAS STANSFIELD

THE article described in this issue, for which a pattern is to be developed, is of somewhat different line to any other previously shown, that of a one-piece pattern for a garbage, or ash chute. Not only can it be used for a chute, but also for a round to square branch of a furnace pipe; it sometimes is necessary to make a Y branch from round to square fan system piping. However we will call it a chute outlet, the square being the lid or inlet to the chute.

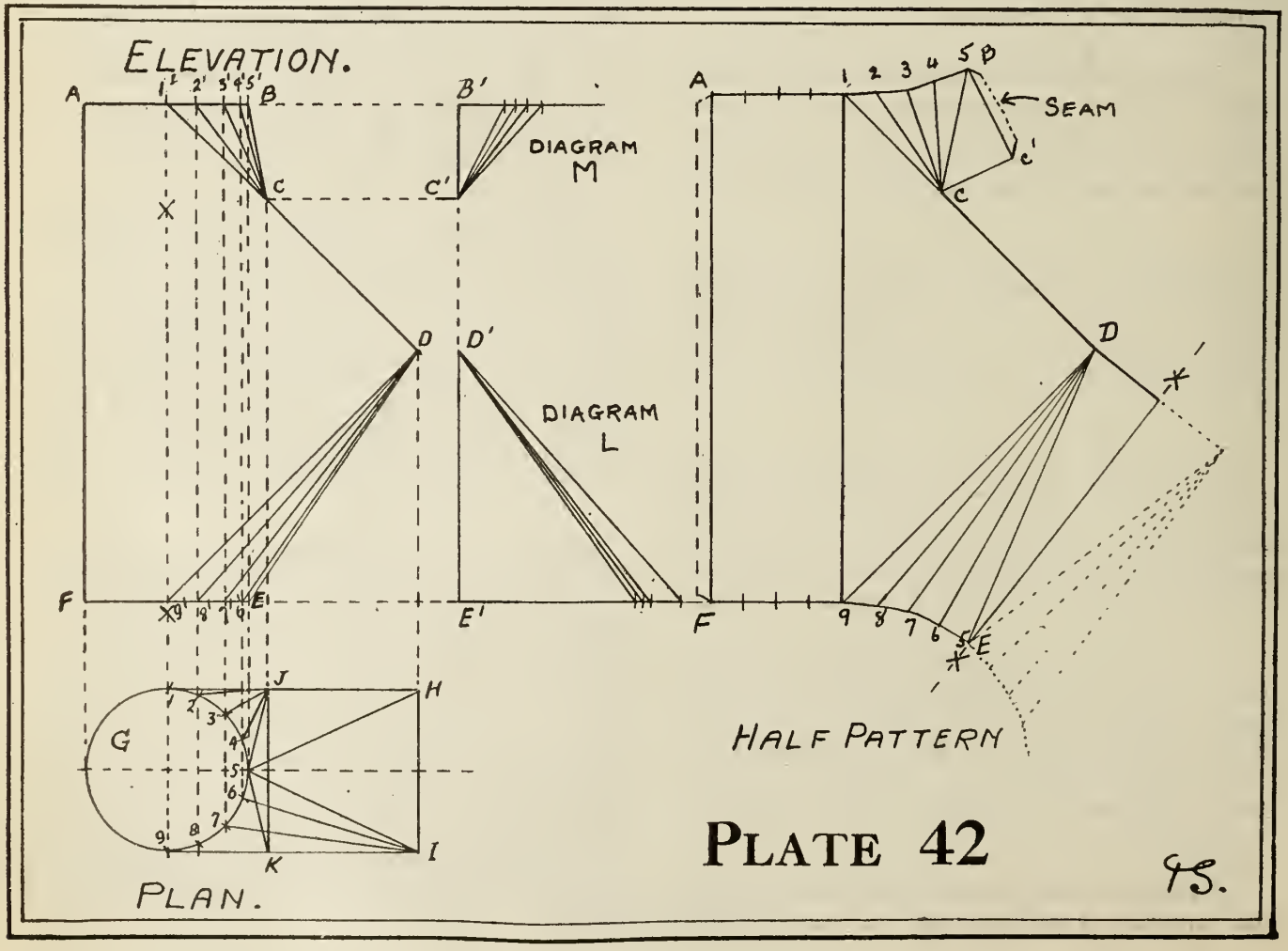
First, determine the diameter of the round part, and draw the plan G and from sides of circle project lines upward as shown at A B F E. Then draw centre line X X, cutting through centre of line F E from centre of circle G. Now take a 45 degree triangle and draw a line from X on line F E, as shown at D, and again draw line D C by reversing the position of the 45 degree triangle. It will be seen that the sides from X to D to C form nearly two sides of a square. Now divide the right hand side of the circle G into 8 equal parts. It will be noted that the line C D is simply the length of the side of square opening and may be any length. Next drop a line from C describing line J K and again another line from point D until the line H I is drawn. Now connect J and H, K and I. To complete the elevation, draw lines from points 9 1 to 9^1, which is the centre of both plan and elevation. Next draw line from 8 2 to 2^1, and so on until all the dotted lines shown are completed.

The next step is to find the true length of lines C, 5^1, 4^1, etc., and D E, 6^1, 7^1, etc., then draw the triangular lines from points H I J K to the circle G, 1, 2, 3, 4, 5, 6, 7, 8, 9, viz., H to 5 and J to 5, 4, 3, 2, 1, and K, 1 to 5, with I to 6, 7, 8 and 9.

It will be noted that only one-half the pattern is developed, but it is simply a matter of turning over the pattern at points X X to complete.

First, lay off two lines the length of A F in elevation and the same distance apart equal to one-quarter of the circumference of the round piece, see A, F, I, D in pattern, next develop the

Continued on page 26



RECLAMATION ACT PASSED

Bill No. 9, an Act to authorize the reclamation of Dominion Lands by drainage, was passed by the House of Commons, on March 24.

Under the Act the Minister of the Interior of Canada, shall have power to reclaim vacant Dominion lands situated within the limits of the Provinces of Saskatchewan and Alberta by drainage works, and to defray the cost of investigation, preliminary survey and the construction of such works out of moneys set apart by Parliament for that purpose, and may include in such reclamation any lands other than vacant Dominion lands that will, or may be, benefited by such drainage works, and may assess the cost of reclamation, including therein the cost of investigation and preliminary survey, upon the said lands, other than Dominion lands, in the manner provided by the drainage laws of the Province in which the lands are situated.

CHLORINE TREATMENT TEMPORARY MEASURE

Defects in the System Render it a Constant Danger to Public Health

Temporary measures frequently become temporizing measures. Expert opinion has asserted time and again that the disinfection of a contaminated water supply by chlorine should never be adopted as a permanent policy. Instead, according to conservation, every community should earnestly endeavor to obtain a pure water supply, either directly, or by means of filtration. Unfortunately, however, many centres, having once adopted the chlorinated water expedient, are loath to provide a permanent system. In brief, a temporizing policy is adopted and is followed until an alarm is sounded in the shape of a flourishing little outbreak of typhoid.

American engineers, state the Ottawa bulletin, have been the leading exponents of the chlorinated method of treating water. It is but natural to expect, therefore, that the system would be most highly perfected in the United States. Nevertheless, during the past few months, cases have come to light there that illustrate some of the inherent defects of the method. At Milwaukee the offensive taste from the chlorine in the water was intensified by the gas-house wastes. Conditions were such that it was even suggested to revert back to the old method of individual boiling of the water, instead of sterilizing at the pumping station. The futility of attempting to have every citizen boil the water used for drinking purposes has long since been demonstrated. The most serious aspect in this instance, and one which may serve as a warning to other places similarly situated, is that an employee at the pumping station, to whom complaints had been made, eliminated the chlorine treatment for a 12-hour period. As a result the mains became filled with contaminated water and there was an increased typhoid incidence. Milwaukee is now trying experiments in water filtration and the conclusions that will be reached when these have been completed are being awaited with keen interest.

At Xenia, Ohio, a small typhoid epidemic was started recently owing to the inferior quality of the chlorine powder used in the water supply. There, too, a movement is on foot to procure from another source, water of a satisfactory and sanitary quality. Such illustrations serve to show the result of temporizing measures in matters relating to public health. It is a strange quality of the "public mind" that often nothing short of a great community misfortune will arouse it to demand civic reform.

LICENSING WATER PLANT OPERATORS

Water Purification and Sewage Treatment Plants Should be Operated by Licensed Attendants.

Most citizens do not fully appreciate the high degree of responsibility that rests on the operators of water purification plants. These operators have in their hands lives of the population served practically to the same degree as a locomotive driver, and more so than a boiler stoker. Why not have them also licensed? Pioneer legislation along these lines has been enacted by the state of New Jersey, the bill providing that hereafter all sewage treatment plants must be in charge of superintendents, or operators licensed by the state. On its introduction in the legislature, the bill was accompanied by a statement of its purpose which is well worth quoting: "The purpose of this bill is to secure the employment of attendants at water-purification and sewage-treatment plants having a higher degree of intelligence and more familiarity with the operation of these plants than is now the case. There are a large number of water-purification plants and sewage-disposal plants now in operation in this state. The experience of the State Department of Health has shown that many of these plants, particularly the smaller ones, are operated in a very unsatisfactory manner. This results, in the case of water-purification plants, in imperfect purification of the water at times and the consequent exposure of the people who use the water, to danger from water-borne disease. The unskilful and careless operators of these plants also result in their rapid deterioration, which ultimately entails upon the municipalities owning them the expenditure of funds for repairs and replacements which would not be necessary were the plants properly operated."

RECENT REGISTRATION

Bonneville and Allard is the name of a new plumbing firm in Montreal.

Dionne and Lestage have set up in the plumbing business at Coaticook, Que.

HOUSING IN WINNIPEG

A bulletin on the housing question in Winnipeg has been issued by Dr. A. J. Douglas, the city medical officer, states the "Free Press." As well as commenting on the Dominion Government's offer to loan money for building purposes to the various Provinces for 20 years at five per cent. interest, and suggesting that it stands in need of amplification, Dr. Douglas supplies a statement as to the actual housing situation that exists in the city.

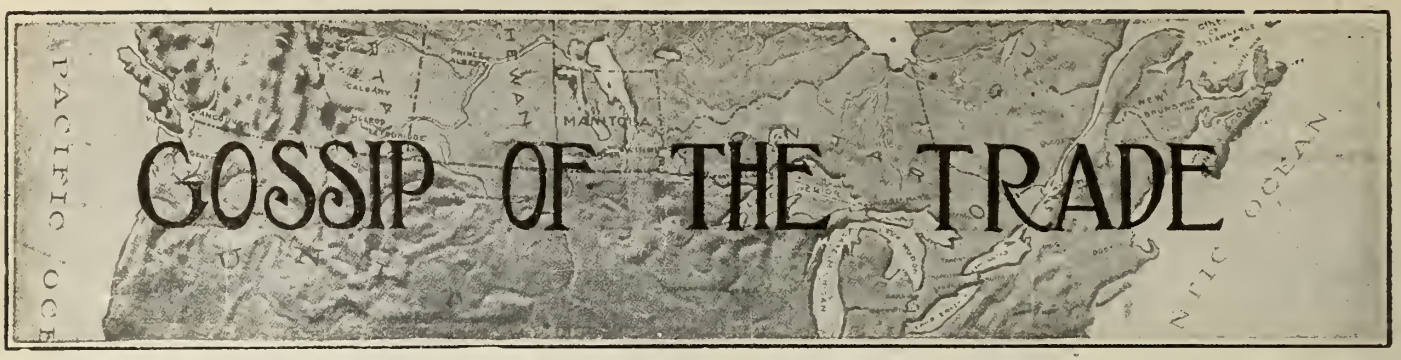
This statement shows that there is a marked tendency for the one-family dwelling house to become a sort of miniature apartment block. In a survey which embraced one-twelfth of the total dwellings in Winnipeg out of 2,097 one-family houses, no fewer than 361 were found to be occupied as tenements; and it is suggested that this proportion justifies the inference that at least 1,000 houses in the city are so occupied.

There are 1,480 vacant houses, and of these about 40 per cent. are stated to be unfit for habitation, and many so poorly built as to be uninhabitable in winter. Some are vacant on account of their location, and others because they are too large for use by single families. A tabular statement shows that while in 1913 there were built 2,051 dwellings and 64 apartment blocks, in the years 1915-16-17-18 there were built 171 dwellings and 11 apartment blocks. Since the war started there have been in the city over 10,000 marriages. "Where," Dr. Douglas asks, "are these newly married couples living?"

The question of housing in the city ought to be passed under review in order that future building operations may be governed by intelligence and discretion. Dr. Douglas touches on this feature of the subject, and cites the systems in operation in New Zealand and Australia, where loans are made to individuals for house building, and where applicants have a choice of 18 approved plans and specifications of houses suitable for the wants of moderate-sized family.

This is the type of house that is not nearly so common in Winnipeg as it should be, and should a deliberately concerted building programme be entered upon it might be possible to go a considerable distance on the way towards supplying the shortage. There are many houses cumbering good sites in the city which should be dismantled if, on examination, it is shown that they cannot be made habitable during the winter months without an undue expenditure of fuel. It is evidently the opinion of the city's health officer that the building regulations have not been ideal. "Unscrupulous builders," he says, "who jeopardize the health and comfort of the future occupants of the houses which they build, should be heavily fined."

The whole leaflet is of an instructive and interesting nature.



ROBT. McHENRY JOINS DUNHAM COMPANY

The C. A. Dunham Co., Ltd., announce that Robt. W. McHenry, recently engineer for J. T. Blyth of Ottawa, has been selected as engineer for their Ottawa office. He will be associated with J. H. Shaver, who is manager of the company's branch sales office at Ottawa. Mr. McHenry is well known to the heating trade through Ontario, who will wish him success in his new connection.

A. J. HAMMOND JOINS EMPIRE MFG. CO., LTD.

Mr. A. J. Hammond, of Winnipeg, has joined the staff of the Empire Mfg. Co., Limited, as representative from Fort William to the Pacific Coast.

Mr. Hammond served his apprenticeship in Toronto as a plumber and after working there for several years, he moved to the United States, where he worked for some time, again returning to Toronto. From Toronto he went to Winnipeg, where he worked for a short time and then he formed the partnership of Hammond & Rodway. Mr. Hammond took an active part in local and Dominion Plumbers' Associations and in 1906 was elected vice-president of the Plumbers' Association for the Dominion of Canada. He was the means of having the first convention held in the West, held in the city of Winnipeg, and at that time he was elected president of the Plumbers' Association for Canada. Mr. Hammond's experience in the plumbing and heating business will no doubt be of great benefit to him in his new duties.

IMPERIAL CITY HEATERS LTD. SUCCEED GOODWIN & CO.

The name of Goodwin & Co. Limited, Sarnia, Ont., has been changed to Imperial City Heaters, Limited, Sarnia, Ont. Change became effective on March 25, and the company is now operating under the new name.

FIRES

In a fire at Montreal, Samuel Shulman, plumber and hardware, sustained a loss of $1.000.

OBITUARY

David A. Gordon, ex-M.P., of East Kent, and prominent manufacturer of Wallaceburg, died at Braithwaite, La. He had been associated with the Wallaceburg Brass Works, Wallaceburg Cooperage Co., Sydenham Glass Works, Dominion Sugar Co., in addition to extensive other interests.

Charles Jackson, of Dixie, Toronto Township, who had the distinction of being the first apprentice plumber in Toronto, passed away on March 18th at the age of ninety-one.

Mr. Jackson, who was a Yorkshire man by birth, came to Toronto in 1850. He was apprenticed as a gasfitter and helped in the piping of St. James' Cathedral and the Normal School. A large family survives Mr. Jackson and his wife, who died seven years ago.

The death of George W. Cole occurred at his late residence, 64 Parkway Ave., Toronto, from heart failure. Mr. Cole was born in Norwich, Ont., and was in his fifty-ninth year He came to Toronto about seven years ago and organized the business known as George W. Cole, Limited, 2002 Dundas St. West, of which he was president and general manager at the time of his death. Private services were held at his late residence, after which the body was taken to Norwich. Mr. Cole leaves a widow, one daughter, Margaret M., and two sons, Brock L. and Grant E.

TRADE NOTES

Sanderson and Robertson, plumbers and steamfitters of Orangeville, have purchased G. A. Campbell's building on East Broadway and will move there next May.

The Department of Public Works, Ottawa, want tenders up to April 16, for the extension to power house and laundry, Military Hospital, Winnipeg.

John A. Pearson, architect, Ottawa, is calling for tenders up to April 12, for the refrigerating equipment needed in the Parliament Buildings at Ottawa.

D. H. Fleming, of St. Catharines, has been appointed town engineer of Owen Sound, and will take over his duties about the first of next month. He has been on the city engineer's staff at St. Catharines.

Tenders are being asked by J. Schofield, architect, Room 459, Union Station, Winnipeg, for the building of a new station for the Canadian National Railways at Moose Jaw. The tenders call for the supply of all labor and materials for the erection and completion of a station building.

C. T. McBride, secretary-treasurer of the Public School Board, St. Catharines, is calling for tenders for competitive plans for two single-storey schools of eight class rooms, with accommodation for manual training, domestic science and kindergarten for this city. Closing date is April 15.

Orr Bros., Vancouver, are sub-contractors for plumbing and heating for the big addition to the King Edward Sanitarium at Tranquille, B.C. The Dominion Construction Company, Ltd., Vancouver, have the contract for the erection of an infirmary and service station to cost $150,000. The work is to be completed by July 1.

A special advisory committee of the Board of Education, London, Ont., at a special session, concluded to recommend the immediate construction of a new $60.000 eight-roomed building for commercial classes at London Collegiate Institute. The work will be proceeded with without delay. Overcrowding necessitates the construction of the school, which will be located on the north side of the Collegiate campus. It was originally thought that such a school could be provided for $40,000.

PROVINCIAL ASSOCIATION ACTIVE IN SASKATCHEWAN

Next Meeting to be Held at Saskatoon on April 6-7-8.

The Provincial Association of Saskatchewan Sanitary and Heating Engineers, recently formed, is actively engaged in developing the work of the association. The next convention will be held at Saskatoon on April 6-7-8. Aside from matters directly connected with the forming of the Association, at the initial meeting, the subject which received most attention was that of "Sewage disposal for country homes." The officers of the Association are as follows:—

President, N. B. Roantree, Swift Current; Vice-president, E. P. Paulin, Regina; Sec.-Treas., James Adam, Regina. Executive: G. Walker, Weyburn, Sask.; J. Brandon, Saskatoon; D. D. Hoover, North Battleford; F. J. Alexander, Moose Jaw; D. B. Bryant, Regina.

Master Plumbers Throw the "Stanes"

With One Slight Hitch at the Eleventh Hour, Montreal Plumbers Throw the Rocks and Secure Handsome Trophies

WERE the plumbers of Montreal not so genial and charitable, they would no doubt have to their credit this year a large number of trophies from throwin' rocks. With a comparatively short season this year and with many demands from as many sources for the use of every sheet of ice on the Montreal rinks, it is, therefore, not surprising that the real match of the present winter should have been left until the eleventh hour.

Arrangements for the finals this year were left with Jim Griffin, and he carried these out well, almost to the point of perfection. There was just a slight hitch at the finish and the trusty weight throwers had, for a brief period, faced the unpleasant prospect of playing on without "one bit refreshment." It was on this wise: "Jim forgot to get the key to the big cupboard where the cheese and crackers repose for brief intervals and where the "juice" well-nigh spoils. It was looking dark indeed for the line-up, and their work on that Tuesday afternoon was the harder owing to soft and heavy ice. But to Mr. Griffin's lasting honor, the key was finally secured and refreshments to the king's taste were supplied in abundance.

The Rinks

The rinks playing off on March 11th were as follows:

J. Greenough	Thos. L. Bain
W. H. Munday	James Buchan
J. A. Gordon	John Watson
Dan Bethune (Skip)	James Griffin (Skip)
Score—12	—9
Dan Bethune	James Griffin
W. H. Munday	J. Greenough
Score—4	—1
Dan Bethune	W. H. Munday —1

As before stated, the ice was most difficult and the heaviness of both sheets prevented better work being done all around. It tried the muscles and developed great sweats which only the assuaging flood of pale ale was equal to counteracting. And, as for sweeping—it was lost motion. Once in a while the hog line was not reached, but that was no reflection upon the veteran whose shot it was, for man trained to expertness in throwin' a forty-pound weight is trained rather to skill in directing his stone, and it is a place where sheer strength does not enter as an important factor.

It was an appreciated moment when the cupboard lock responded to the turn of the key, and with a little "assistance" thus afforded the players went forward to do their best.

Prizes were donated by the Taylor-Forbes Co., Montreal, through the manager, Mr. Smallpiece. Mr. Bethune took the silver stein and Mr. Munday the silver cup thus donated, and on which other eager and almost covetous eyes were cast. Throughout the game real "Master Plumber Fellowship" prevailed and the afternoon was pleasant and profitable.

Notes of the Match.

If there was one regret, it was furnished through the absence of the late R. W. J. Hughes. Always an enthusiast and a keen player, and one who played the game for the delight there was in it, his presence was decidedly missed.

* * * *

It was a real pleasure to watch the countenance of Secretary John Watson as he viewed the progress of the game.

JAMES BALLANTYNE

Chosen by popular ballot as Mayor of Montreal West, and whose photo appeared in issue of March 15th. At that time the name of Mr. Ballantyne was omitted and another used, making this correction necessary.

Is it any wonder there was a keen competition, for after the first play Mr. Watson continued to lend his energetic support to the winners and the would-be winners?

* * * *

No one blamed Jim Griffin for the brief delay in "opening up." It was all the more appreciated when the cupboard doors swung open.

* * * *

President Telles Latourelle is a coming curler. His enthusiasm was well to the fore on the ice and a little toning down of his strong arm will put him in the winning class another year.

* * * *

James Ballantyne must have had difficulty in passing up this match. A prearranged trip to Atlantic City compelled his furnishing a substitute, but Mr. Greenough did good work in his absence.

* * * *

Secretary Watson says that new blood is expected next year from among new members. The French-Canadian members are beginning to take a real interest in the roarin' game.

* * * *

James Griffin contracted a cold during the game, but a couple of days under the quilts did the needful.

* * * *

There was nothing but the best of feeling between the ultimate winners of the silver. They will have a chance to swap next year.

On the Side

THE Hamilton "Times" claims "Yesterday a house was burned down because the fire wagons were bogged in one of the streets." But what has become of that fine brand of folks who used to climb the roof and pour salt down the blazing chimney?

* * * *

THE long lists of tax sales that are appearing in some of the Western papers are proof positive that the tax papers are wearing down the financial resistance of many an Easterner. It is one trick to get in on a good thing, and quite another to get out while the thing is still good.

* * * *

IF a League of Nations is going to come into existence, right now is the time. The reason is that there are problems that only the courage of a united civilization can meet. Once peace is signed the feeling of need for concerted action to regulate international affairs will begin to wane. Right now is the time for action.

* * * *

THE new prices that have been announced for United States steel and iron brought forth every diversity of opinion that could well be imagined. The schedule has been denounced, damned with faint praise and heralded as the forerunner of greater business activity. There is no doubt that the whole ruling has been a compromise between the two factions that were foremost in the negotiations.

INCORPORATIONS

Ontario Sewer Pipe and Clay Products, Limited, capital $300 000, head office Toronto, plans to manufacture and deal in sewer pipes, brick, tile and contractors' supplies.

The National Safety Oil Burner Company, Limited, head office Toronto, capital $40,000, plans to manufacture and deal in oil burners, oil filters, stoves and furnaces.

Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

Steel Shelving, Etc.

Question. — R. Chestnut & Sons, Fredericton, N.B. Please advise where we can buy pressed steel or sheet iron shop boxes and shelving for carrying a stock of pipes, fittings, etc.?

Answer.—Steel shelving, etc., may be purchased from the Dennis Wire & Iron Goods Company, London, Ont., and Geo. B. Meadows & Company, Toronto.—Ed.

The Blue Book

Question.—F. Scholey, 7 and 8 Hicks Block, Calgary, Alta. In your last issue of SANITARY ENGINEER, March 1, 1919, I notice an article entitled, "Cheapening Plumbing." In this article reference is made to a "Blue Book." Where could I get a copy of it?

Answer.—The Blue Book is an official Government report on conditions found to exist by the committee. It may be obtained on application to the secretary of the Ontario Housing Committee, Parliament Buildings, Toronto, Ont. The issue, however, is temporarily exhausted, but a new supply will be ready about April 15, 1919. There is no charge, and you will receive a copy on making request to the secretary.—Ed.

Wisconsin Apprenticeship Bulletin

Question.—H. Coates, 189 Lanford Ave., Hamilton, Ont. I have read with interest some articles in recent issues of the SANITARY ENGINEER on a bulletin issued in the United States, viz., "The Wisconsin Apprenticeship System," of March 15, and "Technical Education Necessary," of February 15. I am interested in technical education and would deem it a favor if you would tell me how to get the bulletin.

Answer.—The Wisconsin Apprenticeship Bulletin was issued by the Industrial Commission of Wisconsin at Madison, Wis., the state capital, early in the present year. You can secure a copy by writing to the foregoing address.—Ed.

McKINNON INDUSTRIES TO EXPAND

As soon as plans now being made by the McKinnon Industries of St. Catharines are completed, the firm will manufacture malleable iron castings, hardware, drop forgings, iron and steel frames, electric welded products and several automobile parts, including transmissions, radiators and steering gears.

UNITS OF ELECTRICAL MEASURE FOR CANADA

Bill No. 17 Passed by House of Commons

The Electrical Units Act was passed by the House of Commons on March 24 and the units of electrical measure for Canada shall be the following:

(*a*) As a unit of resistance, the international ohm, which is based upon the ohm equal to 109 units of resistance of the centimetre-gramme-second system of electro-magnetic units, and is represented by the resistance offered to an unvarying electric current by a column of mercury, at the temperature of melting ice 14.4521 grammes in mass, of a constant cross-sectional area and of the length of 106.300 centimetres arranged in accordance with the specification contained in Schedule A to this Act;

Ampere

(*b*) As a unit of current, the international ampere, which is one-tenth of the unit of current of the centimetre-gramme-second system of electro-magnetic units, and is represented by the unvarying current which, when passed through a solution of nitrate of silver in water, and in accordance with the specification contained in Schedule B to this Act, deposits silver at the rate of 0.00111800 of a gramme per second;

Volt

(*c*) As a unit of electro-motive-force, the international volt which is the electro-motive-force that steadily applied to a conductor whose resistance is one international ohm, will produce a current of one international ampere. The Weston Normal Cell may be used as a standard of electric pressure, and when set up in accordance with the specification contained in Schedule C, to this Act may be taken as having, at a temperature of 20°C., an electro-motive-force of 1.0183 volts.

3. Such standard apparatus as is necessary to produce the units of electrical measure described in this Act, shall be deposited in the Department of Trade and Commerce and shall form part of the system of standards of measure and weight established by the *Weights and Measures Act*.

4. The *Electrical Units Act*, chapter fifty-three of the Revised Statutes of Canada, 1906, is hereby repealed.

PRACTICAL SHEET METAL WORK

(Continued from page 22)

diagrams L M in the usual way, which gives the true length of the slant lines for top and bottom gussets.

It will be noted that points 1 to D and D to 9 and 9 to 1 form really another true elevation of the side. From the various points transfer the corresponding measurements to the triangular side in pattern which in practice is really developing circular, or curved stretchout lines of the gussets required. While this is really a one-piece pattern, it will be noted that there require to be two seams—one at the back of the pipe and one at C^1 B, at top of the pipe.

Continued in next issue.

EXPORT RESTRICTIONS NOW REMOVED

Advices have been received by G. T. Milne, Montreal, and F. W. Field, Toronto, British Trade Commissioners in Canada, that the following additions have been made to the list of goods which may be exported without license:

Lists of export restrictions recently removed:

Barrels and casks, boilers, fuel economizers for boilers, lead coated sheets, cast iron pipes, iron or steel wire, wire rope, cast iron radiators, railway sleepers (iron or steel), railway springs, railway wheels, axles and tyres, railway constructional material except rails, terne plates.

BANKRUPTCY ACT BEFORE THE HOUSE

THE Bill in respect to bankruptcy which the Government has introduced at Ottawa will supply something which has been lacking in the commercial laws of Canada, although opinions regarding it are divided. The Act seeks to establish a uniform system of law and procedure throughout Canada in respect to matters of bankruptcy and insolvency.

A bill was introduced last year, which was prepared by seven lawyers from different parts of Canada. The main change in this year's bill is that it applies to all incorporated companies except railroads, banks, trust companies and insurance companies. The provisions of this year's bill applies to all persons, firms and corporations. This is a change from last year's bill, which provided that corporations could go into bankruptcy voluntarily.

RAILWAY'S CASH PLAN MAY GO INTO DISCARD

While no official statement has as yet been made by the Canadian Railway War Board, it is unofficially stated that the proposal of the railways to demand cash from shippers after June 1 has died a natural death. Nominally, the proposition has been left over until June 1 so as to give shippers a chance to make the necessary arrangements with bond houses to furnish the bonds required. It is stated, however, that the present plan is to allow the proposal to be forgotten. Circular 97, which was to have become effective on March 1, roused such a storm of protest that the measure was laid over. Manufacturers declare that they will never agree to the demand of furnishing a bond. They do not mind settling their freight bills in cash, but they declare there is no logical reason why they should be asked by the Canadian Railway War Board, the railways or anybody else, to furnish a bond, as long as their credit is unquestioned.

RAPPED CANADIAN PATENT OFFICE

Montreal Speaker Said That It Imposed Nothing More Than a Tax on Brains.

A strong criticism of the Canadian Patent Office, and suggestions for remedying defects, were contained in a paper read by H. A. Budden, A.E.I.C., at the meeting of the Montreal branch of the Engineering Institute of Canada.

Up to the present, said Mr. Budden, nearly 4,000,000 patents had been issued in the world, Canada issuing 188,000, Great Britain issuing 515,000, and the United States issuing 1,292,000. Unlike Great Britain, the United States and France, Canada did not classify her patents, he said; neither did she print patent specifications, and the cost of a typewritten copy of a patent was exorbitant. Mr. Budden pointed out a number of instances where, he said, the patent office could improve its procedure so as to afford greater and clearer information to the public, thus making the record as useful and complete as possible.

The financial position of the Patent Office was curious, he said. For the year ended March 31, 1918, there was a balance of receipts over expenditure of $101,520, and, said he, it was an injustice from a public point of view that the patent office should make a large annual profit out of the fees paid by inventors. It was merged in the ordinary revenues of the country and was a veritable tax on brains. The strain of protecting and maintaining patents was proved by the frequency with which patents were dropped merely in order to save renewal fees. The Canadian Patent Office had in the past been a milch cow supplying the Government with a large amount of funds, he said. The Patent Office could be made a more useful institution than it was at present, it being now chiefly occupied in granting monopolies to others than Canadians. Last year only 973 patents out of 7,238 were granted to Canadians.

NEW SARNIA INDUSTRY

The H. H. Robertson Company of Canada, capitalized at $200,000, has purchased the plant of the Sarnia Metal Products Company at Sarnia, Ont., and plans to commence operations about May 1 on the manufacture of asbestos covered steel roofing and siding; also ventilators, gutter and down pipes, skylights and asphalt paint. The officers of the new concern are: President, H. H. Robertson, Pittsburgh; vice-president, Jas. Playfair; secretary, R. I. Towers; Treasurer, N. S. Gurd; managing director, C. McKenzie. The new managing director was formerly with the hardware firm of McKenzie, Milne & Co., Limited, of Sarnia.

R. A. SHAW

Port Arthur, Ont., ready for action. R. A. says he can carry 300 lbs. in box of side-car, and cost of upkeep is less than shoe leather.. He has used this form of transportation for the past four years.

BIG INCREASE IN TORONTO PERMITS

The statistics at the Toronto City Hall tell an interesting story. During the first two months of 1918 there were only sixteen permits taken out in the City Architect's office for building of dwellings in the city of Toronto—three for solid brick and thirteen for cheaper houses, the total cost of these houses being estimated at $37,200. Notice the percentage of better class houses compared with the poorer type. This would indicate that the building was not done by the so-called moneyed class, as the houses were of the laboring man's type. Compare the above figures with the following:

Hundred and Ninety-Two in "Nineteen"

From the same source comes the information that the statistics for the first two months of 1919 show that there were permits taken out with an estimated total cost of $901,560; of this amount $391,750 was for solid brick dwellings, $35,500 for brick and roughcast, and $5,100 for frame, representing a total of one hundred and ninety-two houses compared with sixteen in 1918, an increase of 1,100 per cent. in number of houses, or 1,068 per cent. in dollars and cents. And there is every indication that the bulk of these permits will be acted upon within the time limit of six months. Few builders would go to the expense of having plans prepared and permits taken out unless they anticipated taking action, especially when there is a great shortage of houses.

Evidence that the building permits are being used is in the fact that hardwaremen specializing in builders' supplies claim an increase of business in this department of from 25 to 33 per cent. over last year for the same period—January and February.

FAMILY WIPED OUT BY ESCAPING GAS

Mrs. Eva Hogarth and her four children, Frederick, aged 9 months, Helen, aged 5, Archie aged 4, and William aged 3, the entire family of Mr. F. J. Hogarth, plumber, of 43 Rainsford Road, East Toronto, were wiped out by gas poisoning on March 18.

The children are supposed to have been playing house in the kitchen of their home, and when Mrs. Hogarth left the room, to have turned on all four burners of the gas stove. On Mrs. Hogarth's return, finding her children lying on the floor and the room full of gas, she is supposed to have been overcome. She evidently made some effort to reach the baby, Frederick, for she was found near the sink holding him in her arms.

TORCH EXPLODED

William Richardson, tinsmith, Dutton, Ont., was terribly burned when a gasoline torch he was using exploded and ignited his clothing. The accident occurred, it is stated, while he was adjusting the valve and some of the gasoline leaked out. His condition is reported as serious.

Health Act Before House

New Department Will Have Charge of Child Welfare Work—Inspection of Public Buildings With Regard to Sanitation

A great deal of comment has been raised by brief despatches from Ottawa in the daily press that Hon. Wesley Rowell had introduced a bill into Dominion House creating a new Department of Health. Very little definitely, however, was known, and the trade was able to get very little information. The bill received its first reading on March 26th, and if it passes will have a great affect on the trade. In view of this fact, SANITARY ENGINEER is glad to be able to produce it in its entirety.

BILL 37

An Act respecting the Department of Health:

1. This Act may be cited as The Department of Health Act.

2. There shall be a Department of the Government of Canada which shall be called "The Department of Health," over which a Minister of the Crown to be named by the Governor in Council shall preside.

3. (1) The Governor in Council may appoint an officer, who shall be called "the Deputy Minister of Health," who shall be the deputy head of the Department and who shall hold office during pleasure.

(2) Such other officers, clerks and employees as are necessary for the proper conduct of the business of the Department may be appointed in accordance with the provisions of the The Civil Service Act, 1918, and of any Acts in amendment thereof, all of whom shall hold office during pleasure.

(3) The Governor in Council may, subject to the provisions of The Civil Service Act, 1918, or any amendment thereto, transfer to the Department of Health any officer, clerk or employee now in the employ of His Majesty or of either or both Houses of Parliament, and subsection two of section seventeen of the said Act shall not apply to such transfers, and the money voted by Parliament for the financial year ending the thirty-first day of March, one thousand nine hundred and twenty, applicable to the payment of the salary or the increase of salary of any such officer, clerk or employee so transferred shall be available for the payment of his salary or increase of salary or the salary of any person appointed in his place in case of his death, retirement or dismissal while serving in the Department of Health, in the same manner and to the same extent as if such officer, clerk or employee had not been so transferred.

4. The duties and powers of the Minister administering the Department of Health shall extend to and include all matters and questions relating to the promotion or preservation of the health and social welfare of the people of Canada over which the Parliament of Canada has jurisdiction; and, without restricting the generality of the foregoing, particularly the following matters and subjects:—

(a) Co-operation with the provincial, territorial, and other health authorities with a view to the co-ordination of the efforts proposed or made for preserving and improving the public health;

(b) The conservation of child life and child welfare;

(c) The inspection and medical care of immigrants and seamen, and the administration of Marine Hospitals;

(d) The supervision, as regards the public health, of railways, boats, ships and all methods of transportation;

(e) The supervision of Federal public buildings and offices with regard to the health of Civil Servants and other Government employees therein;

(f) The enforcement of any rules or regulations made by the International Joint Commission, promulgated pursuant to the treaty between the United States and America and His Majesty relating to boundary waters and questions arising between the United States of America and Canada, so far as the same relate to public health;

(g) The administration of the statutes mentioned in the Schedule to this Act, and of Acts amending the same, and also of all orders and regulations passed or made under any of the said Acts; and all the duties and powers of any Minister of the Crown under either of the said Acts or any of the said orders or regulations, are hereby transferred to and conferred upon the Minister of Health;

(h) The collection, publication and distribution of information to promote good health and improved sanitation;

(i) Such other matters as may be referred to the Minister by the Governor in Council.

5. The Governor in Council shall have power to make such regulations as may be necessary to give effect to and carry out the objects of this Act, and to impose penalties for any violation of such regulations.

6. There shall be a Dominion Council of Health consisting of the Deputy Minister of Health, who shall be chairman, the chief executive officer of the Provincial Department or Board of Health of each province, and such other persons, not to exceed three in number, as may be appointed by the Governor in Council, who shall hold office for three years. The Dominion Council shall meet at such times and places as the Minister may direct, and shall be charged with such duties and powers as the Governor in Council may prescribe.

7. The Minister shall annually lay before Parliament, within fifteen days after the meeting thereof, a report and statement of the transactions and affairs of the Department during the year then next preceding.

VENTILATING THE MODERN SCHOOL

Continued from page 12

into the construction of the building. In other cases old buildings were remodelled and the system had to be fitted in under the very worst conditions. In several of the schools described the writer only had charge of the designing of the heating and ventilating systems. Many of these buildings are situated in the coldest cities on the American continent. So the reader can be quite satisfied that any recommendations made here have stood the test of experience.

About fifteen years ago the school boards in Western Canada became interested in placing more up-to-the-minute ventilating systems in their buildings than they had previously installed.

Before that time it had been our custom to instal warm-air systems of heating and ventilating in our schools. Those systems were, as a rule, installed so as to work on the principle of the indirect extraction of the foul air, and when we came to the matter of designing a steam heating and ventilating system for a school we had an awful time breaking some men away from their preconceived idea of the lay-out of ventilating stacks.

In the old-time warm-air systems, large tubular furnaces were set up in the basement and enclosed in brick chambers, these chambers connecting their bases with the outer air by means of a fresh air passage at the rear of the furnaces. The cold air came into the heated chambers by way of the fresh air passage and was heated by passing over the tubular furnaces. The tops of the heater chambers connected to flues leading to the class rooms. These flues were usually made of brick and ranged from 5 to 6 feet in area. Each class room had a fresh air flue and as a rule discharged its warm fresh air into the class room at a point near the ceiling.

We had to provide some means of escape for the foul air in the class room, so we provided another flue for each class roof and that flue opened into the class room at the floor line. The other end of the flue would be connected to a "gathering chamber." Here all of the foul air flues exhausted the foul air from the classrooms into a large stack. For every four classrooms we have a main ventilating stack running clear from the basement to above the roof, and that stack was generally about four to five feet square inside measurement. It was hard to convince some people that all of this indirect way of extracting foul air when we changed over to the steam system was unnecessary, so we went ahead for a long time installing indirect "school pin" radiators in the old style heater chambers, and heating the air for ventilation. We also provided direct radiators in each class room and in the corridors. After a time we managed to get the big stack eliminated from our designs and then we continued our smaller vent flues through the roof instead of running them to the basements. We then found that the flues we had used for the indirect extraction of foul air were too large for direct extraction as the air rushed out through these flues at too high a velocity, so we began to cut down the area of the fresh and foul air flues until we found what was the best size for certain conditions. We made our flues large enough so that we could get a certain measure of ventilation on muggy days, and by means of throttling dampers reduce the area of these flues when necessary on the clear, cold, wintry days when the air would be rushing through them at a speed of 500 feet a minute instead of the 200 feet figured for the muggy day.

This was all for gravity systems of ventilation. When the blast and exhaust fans come into use in our public schools it simplified our work, as we were then able to figure for one condition that we could be reasonably sure of controlling, and that was the quantity of air that the fans would handle under a fixed speed at the pressure conditions surrounding the installations.

To-day there are many excellent books on this subject, but the writer believes that what the average engineer requires is a knowledge of about what size ducts are used in general school work together with the proportion of radiating surface and the boiler power required per sq. ft. of indirect surface.

In some of the articles following this we will show drawings of the various types of systems, and in closing this will state: That the average modern classroom of 32 ft. x 25 ft. x 13 ft. requires from 200 to 250 sq. ft. of radiation for heating. It requires from 80 sq. ft. to 90 sq. ft. of indirect radiation to heat 30 cubic feet of air for each of its 45 pupils. Each fresh air flue area should be nearly 2 sq. ft. The above is for fan ventilation. For gravity ventilation there should be 150 sq. ft. of indirect radiator supplied with a fresh air flue area of 6 sq. ft.

Indirect radiation as installed for ventilating work is equivalent in direct radiation approximately as follows: With the fan blowing cold air against the radiator 5½ times, thus 90 sq. ft. of indirect equals 490 sq. ft. direct. In a heater chamber with cold air passing through by gravity, 3 times, thus 150 sq. ft. indirect equals 450 sq. ft. direct.

The above figures are not exact to a foot but they are close to the general practice.

(To be continued in next issue)

C. S. D. S. & H. EXECUTIVE IS BUSY

In order that there may be prompt and efficient consideration of any requests, and that the programme may be whipped into shape at as early a date as possible, the executive of the Domestic Sanitary and Heating Engineers is holding weekly meetings in Montreal. Send in your correspondence to Secretary John Watson, 4145 St. Catherine St. West, Montreal, pointing out the problems you have met and making any constructive suggestions. They will be welcomed and Secretary Watson is closely in touch with many matters, having had a long period of service with the Society. He will be the happier if all outside associations will communicate with him and outline their intentions and wishes regarding the big convention.

Remember the dates—June 3rd and 4th and PLAN TO COME.

GAS OF LESS POISONOUS CHARACTER

Following the death of five persons in one family from illuminating gas, a letter appeared in the Toronto "Star" from Robert W. King, of 10 Walmer Rd., Toronto, dealing with "gas poisoning." The letter follows:

"In 1911, as a result of investigation Mr. King found that the increasing number of deaths from gas poisoning at that time were due to the increased use of water gas along with coal gas. Later Mr. King visited a number of American cities on a tour of discovery and found that a number of these cities had passed a by-law prohibiting the use of water unless some chemical was used with it that gave it a very strong and disagreeable smell. He goes on to say:

"My attention to the recent large number of cases due to gas poisoning has been more particularly aroused by the account in the morning's papers of the sad case of five suffocated by gas and the presentiment that had the gas been of a less poisonous character all these lives might have been saved.

"I am making no assertions or charges of any kind as to what our Consumers' Gas Company is doing, but simply suggest that an investigation would be in order. Is it possible that the safety of our citizens is being jeopardized through carelessness—or greed in desire to pay the highest dividends possible on too highly favored or watered stock?

"It appears to me that such an investigation would be quite in order with the spirit of the age, since the war."

No doubt many readers of the SANITARY ENGINEER have views on this subject, and we would like to have expressions of opinion from our readers. —ED.

CATALOGUE AND BOOKLET DEPARTMENT

Galvanized Sheets Bundling Table

The Dominion Shhet Metal Corporation Limited, Hamilton, Ont., has issued an attractive galvanized sheets bundling table measuring 10½ by 14 in. This table gives practical and interesting as well as valuable information regarding the weight per square foot in ounces and in pounds, also square feet per sheet, weight per feet, number of sheets, weight of bundles. Copies will be supplied free to the trade upon request.

Housing Schemes

The Leeds Fire Clay Company Limited ,of Wortley, England, issued a 16-page booklet, entitled "Housing Schemes," in five chapters, on the following subjects: baths, sinks and closets, fire places and smoke prevention, various materials and fittings. Copies of the booklet will be supplied upon request.

SANITARY CONDITIONS AT KITCHENER SCHOOL BAD

Insanitary conditions at Kitchener School, North Toronto, are still the subject of lively debate among the trustees and the residents of that district. Letters have passed back and forth from the county and city school boards from the city and provincial boards of health, engineers and others.

"We visited the school, and it is horrible," declared Trustee Douglas. The pupils are using surface water and outdoor closets. There is no drainage because neither the city nor the county will pay the $1,200 or $1,500 to lay the sewer some 300 feet from the city limits to the school."

Kitchener School is just beyond the city limits of Toronto and this squabble has gone on ever since the school was built two years ago.

DROP IN CAST IRON PIPE PRICES

An important drop in cast iron pipe and pipe fitting prices occurred last week when two Toronto firms, the Anthes Foundry Co. and The Toronto Hardware Co., announced some very important revisions of their price list, giving as much as 35 per cent. off the price of 2 to 6 inch cast iron fittings. The complete list of these changes follows:

Cast Iron Pipe

4 inch medium and heavy	25% off
2, 3, 5, and 6 inch med. and heavy	20% off
8 inch	15% off

Cast Iron Pipe Fittings

2 to 6 inch	35% off
8 inch	15% off

Market Conditions and Tendencies

Statements Regarding Supplies and Trend of Prices

THE MARKETS AT A GLANCE

A NUMBER of price revisions, all with a downward tendency, have taken place, and a number of others are in process. This uncertainty regarding prices is reflecting itself in business, which in many lines is reported as quiet. There is a feeling, however, in the trade that with the revision of prices to lower levels business will steadily improve. There is no doubt about the amount of business to be had, it is stated, but many are holding off hoping to take advantage of the lower prices. A great many inquiries are being received. Some firms state that up to the present time this spring they have had more inquiries than they had in the past three years. The outlook for business is bright.

The new prices put into effect in the United States for iron and steel are reflected in the markets here, as Canadian firms are meeting them all along the line.

An important revision has been made in the prices of soil pipe and fittings. The new prices, it is stated, are likely to hold for some time.

Solder prices are a little easier. While lead has shown no change there are indications that it may advance before long.

Prices of tin are expected to be a little lower shortly.

Copper stocks are very large, and only a fair amount of business is offering at from eighteen to twenty cents.

A steady volume of most satisfactory business in fittings and supplies for firms who have shipbuilding contracts is coming in. This activity is general from coast to coast. No changes in prices have been made and none is looked for immediately.

TORONTO, Mar. 27.—Prices of galvanized sheets have again been revised slightly. Business in ingot metals is quiet, copper showing tendency to sag and tin indications of an advance. An important revision in the prices of soil pipe fittings has been made. New prices are out also for flat rim sinks. Solder is a little lower.

No Changes Shown In Range Boilers

RANGE BOILERS—The new prices for range boilers which were outlined in the last issue of SANITARY ENGINEER are still holding. Business in these lines is fair with every prospect of steady improvement as many inquiries are being received which may reasonably be expected to develop into orders before long. Prices are as follows for standard boilers:

12 gal, and under, $9.50; 20 gal. and under, $10.50; under 30 gal., $11.50; 30 gal., $12.25; 35 gal., $15.00; 40 gal., $18.00; 52 gal., $24.00; 66 gal., $33.00; 82 gal., $40.00; 101 gal., $50,00; 120 gal., $65.00; extra heavy boilers quoted for the 30 gal., $14.50; 35 gal., $17.00; 40 gal., $20.00; 52 gal., $28.00; 66 gal., $38.00; 82 gal., $47.00; 100 gal., $58.00; 120 gal., $75.00; 144 gal., $90.00; 168 gal., $100.00; 192 gal., $110.00.

Range Boilers	Standard	Extra Heavy
30-gallon	$12 25	$14 50
35-gallon	15 00	17 00
40-gallon	18 00	20 00
52-gallon	24 00	28 00
66-gallon	33 00	38 00
82-gallon	40 00	47 00
100-gallon	50 00	58 00

Prices Unchanged For Heating Coils

HEATING COILS — No change has been made in heating coils and the following are the quotations:

30 gal. and under, $12.00; 35 gal., $14.00; 40 gal., $16.00; 52 gal., $20.00; 66 gal., $25.00; 82 gal., $28.00; 100 gal., $31.00; 120 gal., $35.00; 144 gal., $40.00; 168 gal., $45.00; 192 gal., $50.00.

New Prices For Flat Rim Sinks

ENAMELWARE—Business prospects in this line are steadily improving as the building programme that is being worked out all over the Dominion gradually develops. Numerous inquiries are coming in and some big contracts will be figured on shortly. Quotations are as follows:—

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide		$32 10
Bath-tubs, 5½ ft.		35 70
Basins, flat back, 14 x 15 in.		6 00
Do., corner, 15 in.		5 95
Sinks, roll rim, 18 x 30 in.		15 05
Sinks, flat rim, 20 x 30	6 47	6 35
Do., 18 x 30	5 62	5 50
Do., 18 x 24	5 12	5 00
Do., 16 x 24	4 92	4 80
Do., 14 x 20	4 25	....
Closets, oak tank and seat		27 00
Do., enamel iron or white vitro tank		29 00

Soil Pipe, Fittings Revised Downward

SOIL PIPE, FITTINGS.—The lower price levels predicted in the last issue of SANITARY ENGINEER are now in effect. Business is reported as fair with every prospect for immediate and steady improvement. The new quotations are:

SOIL PIPE AND FITTINGS

Medium and extra heavy soil pipe, 2 in. to 6 in.	20%
Medium and extra heavy soil pipe, 4 in.	25%
Medium and extra heavy fittings, 2 in. to 6 in.	35%
8 in. soil pipe and fittings	15%

C. I. PIPE FITTINGS

Cast iron fittings	12½%
Plugs	22%
Bushings	28%
Unions, standard	35%
Dart unions, ¼-inch to 2-inch	20%
Do., 2½-inch and larger	12%
Nipples, up to 4-inch	45%
Do., 4½-inch and larger	40%
Do., running thread 4-in. and under	25%
Couplings, 4-in. and under	35%
Do., 4½ in. and larger	15%

MALLEABLE FITTINGS

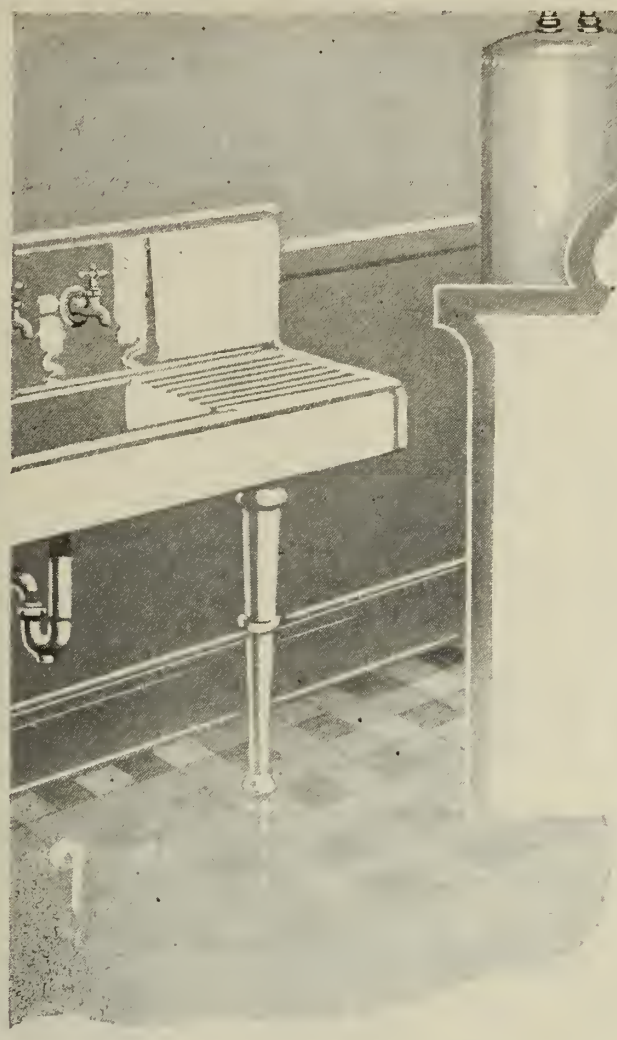
	Black	Galv'd
Malleable Fittings, Class A, lb.	0 53	0 66
Do., Class B, lb. net	0 24	0 33
Do., Class C, lb. net	0 16	0 24

Prices of Valves Show No Change

VALVES—While valve prices show no change, a splendid volume of business is being handled. Much of this is coming from firms which have shipbuilding contracts and orders are coming in from Halifax to Vancouver, wherever shipbuilding is in progress. Quotations are as follows:—

	Discount off list
Compression work, standard	45
High grade	41
Fuller work, standard	43
High grade	36
Basin cocks, No. 0 standard	38
Nos. 1 and 2	38
Bath cocks	48
Flatway stop and waste cock, standard	45
High Grade	45
Roundway stop and waste cocks, standard	45
High Grade	45

Continued on page 32



MUELLER

Compression Sink Bibbs

SIMPLE elegance, combined with superior strength and wearing quality. is what you give your customer when you install **MUELLER** goods.

The many advantageous features of **MUELLER** compression bibbs give maximum service from the bibb as a whole. The anti-spreading device that breaks up the whirling motion of the water and the corrugated stem and handle, allowing the handle to be set at any angle without becoming loose or wobbly, are only two of these features.

MUELLER Bibbs are the best the market affords. Write for prices.

H. Mueller Mfg. Co., Limited

SARNIA CANADA

MUELLER

Continued from page 30

Brass steam cocks, standard, add 10%.	
Globe, angle and check valves, standard.	Net
Do., removable disc	Add 5%
Radiator valves, standard	10
Do., removable disc	Net List
Basin Cocks—	
No. 0 and 1, Fuller pattern	43
Globe, angle and check valves, standard, medium pressure	10
Radiator valves, standard med. pressure.	30
Radiator valves, removable seat, medium pressure	25

Wrought Pipe Prices Will Be Revised

WROUGHT PIPE—Prices of wrought pipe so far have been unchanged, but word is expected at any time that slightly lower quotations are in effect. This is a natural development of the changes made in iron and steel as a result of the reductions now in effect in the United States. The present quotations are:

WROUGHT PIPE
Price List No. 38—January 6, 1919.

	Standard Buttweld Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
⅛ in.	$ 6 00	$ 8 00	$.....	$.....
¼ in.	4 68	6 81	5 28	7 41
⅜ in.	4 68	6 81	5 28	7 41
½ in.	6 21	7 78	7 06	8 63
¾ in.	7 82	9 95	8 97	11 10
1 in.	11 56	14 71	13 26	16 41
1¼ in.	15 64	19 90	17 94	22 20
1½ in.	18 70	23 76	21 45	26 54
2 in.	25 16	32 01	28 86	35 20
2½ in.	40 37	51 19	.....	.....
3 in.	52 79	66 94	.....	.....
3½ in.	67 16	84 18	.....	.....
4 in.	79 57	99 74	.....	.....

	Standard Lapweld Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
2 in.	$ 28 86	$ 35 34	$ 32 56	$ 39 03
2½ in.	42 12	52 36	49 97	58 21
3 in.	55 08	68 47	62 73	76 12
3½ in.	69 00	86 94	78 20	96 14
4 in.	81 75	103 00	92 65	113 90
4½ in.	93 00	118 00	112 00	137 00
5 in.	108 00	137 00	130 00	159 00
6 in.	140 00	178 00	169 00	206 00
7 in.	183 00	232 00	219 00	268 00
8L in.	193 00	244 00	230 00	281 00
8 in.	222 00	281 00	265 00	324 00
9 in.	266 00	336 00	.....	.....
10L in.	246 00	312 00	294 00	360 00
10 in.	317 00	402 00	379 00	464 00

Terms, 2% 30 days, approved credit.
Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Cotton Waste and Oakum Prices Steady

WASTE, OAKUM—Business in these lines is reported as only fair. Prices are unchanged and are as follows for waste:

Fancy, 15½c per lb.; Lion, 14c; Standard, 12½c; Popular, 11c; Keen, 9½c. Cotton waste is now pretty well down to lower price levels, quotations being revised a couple of weeks ago on some lines. New prices on some of the other numbers, which are also lower, are shown herewith: White, XXX, 19c per pound; XX, 18c; X, 16½c; XC, 15c; Japanese, 14c; colored, No. 5, 15c per pound; No. 1, 13½c; No. 7, 12c; No. 1A, 10¾c; No. 1B, 9½c.

Oakum is unchanged and general business conditions are reported fair.

	Per 100 lbs.
Best American	$21 00-$22 00
Clipper, spun	....- 21 00
Do., unspun	....- 10 50
Plumbers', spun	10 00- 10 50

No Changes Shown In Boiler Tubes

BOILER TUBES—A fair volume of business is reported in tubes. Prospects are for an improvement as a number of inquiries are being received. Quotations are as follows:

BOILER TUBES—	Per 100 feet Seamless	Lapweld
1 inch	$28 00	$.....
1¼ inch	32 00	.....
1½ inch	35 00	28 00
1¾ inch	35 00	28 00
2 inch	40 00	28 00
2¼ inch	43 00	30 00
2½ inch	45 00	35 00
3 inch	52 00	40 00
3¼ inch	.....	47 00
3½ inch	62 00	48 00
4 inch	70 00	60 00

Black Sheets Firm; Galvanized Lower

SHEETS, PLATES—There is a decidedly firmer tendency in the prices of black sheets and slight increases are noted this week in a number of lines. The quotations are as follows:—

BLACK SHEETS—	Per 100 lbs.	
10 gauge	$6 30	$7 50
12 gauge	5 55	6 05
14 gauge	5 60	6 10
16 gauge	5 70	6 20
18-20 gauge	....	6 30
22-24 gauge	....	6 35
26 gauge	....	6 40
28 gauge	....	6 50
3-16 inch plate	....	5 75
¼-inch boiler plate	....	5 50

Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

GALVANIZED SHEETS—		
10¾ oz.	$8 10	$8 50
U.S. 28	7 70	8 20
U.S. 26	7 40	7 90
22 and 24	7 25	7 75
18 and 20	7 10	7 60
16	6 95	7 45
14	....	6 80

Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

Lead Products and Solder Little Easier

LEAD AND ZINC PRODUCTS — A steady improvement in business is reported with prices showing a slightly easier tendency. Solder is down to 30 cents and lead sheets have been revised slightly. Quotations are as follows:

Lead pipe lb.	....	$0 12
Lead waste pipe, lb.	....	0 13
Lead traps and bends	....	Net list
Lead wool, lb.	....	0 14
Lead sheets, 4 to 6 lbs., sq. ft., in rolls, lb.		0 10¼ 0 10½

Cut sheets ½ to ¾c lb. extra and cut sheets to size, 1c lb. extra.

Solder, guaranteed, lb.	$0 35	0 37
Solder, strictly, lb.	0 33	0 37
Solder, commercial, lb.	0 30	0 36
Solder, wiping, lb.	0 29½	0 42½
Solder, wire, lb.	0 40	0 45½
Zinc sheets, per lb.	....	0 20

No Price Changes For Old Materials

OLD MATERIALS—Business remains very quiet in these lines, although there are hopes that the lower prices for iron and steel may start something before very long in the way of a general improvement that will help the scrap market. The quotations are:

Dealers' Buying Prices—		
Tea lead	....	0 03
Heavy lead pipe	....	0 04
Pipe scrap	....	8 00
Stove plate, per ton	....	10 00
No. 2 busheling	....	8 00
Yellow brass	....	0 06
Red brass	....	0 08½
Light brass	....	0 05
Scrap zinc	....	0 05
Heavy copper	....	0 15
Wrought iron, No. 1, per gr. ton	....	15 00
No. 1 machinery cast	....	14 00
Heavy melting steel	....	9 00

Lead is Easier; Tin Prices Firm

INGOT METALS—Copper stocks are reported very large all over the country and with only a fair volume of business offering the tendency is for prices to be a little easier. The range of quotations runs from 18 to 20 cents a pound. Lead is now selling at from 7 to 7½ cents a pound with a fair demand and prospects for an advance. Tin prices are uncertain, but it is stated that the tendency will be toward lower prices.

COPPER—Future prices will be governed to some extent by overseas business, and as little has developed in copper so far there are very large stocks on hand. There are indications however that the domestic demands may increase materially before long. In the meantime prices show little change.

TIN—Tin prices are expected to be slightly lower, but no reduction has as yet been made. There has been a fair demand at the ruling price of 60c a pound.

LEAD—The market is firm and there is a tendency toward higher prices. An increasing demand is apparent and many inquiries are coming in. Prices rule from 7 to 7½c.

ALUMINUM—The volume of business is reported as only fair. Quotations are being made at 50c or thereabouts, depending on quantities.

ANTIMONY—Business is quiet in this line with prices holding steady at 8¼ to 8½ cents, and no indications of a change.

"VALVENE" Discs (REGISTERED)
Specially prepared for Hot and Cold Water Taps. All sizes from ½ inch to 1½ inches. Soft, Pliable, and "Joint-Perfect."
Price List and Samples on Application.
THE COMMERCIAL INDIA RUBBER MANUFACTURING & SUPPLY CO., LIMITED
SOLE MANUFACTURERS
585 Commercial Road, LONDON, E.1.

A DRY CELLAR!

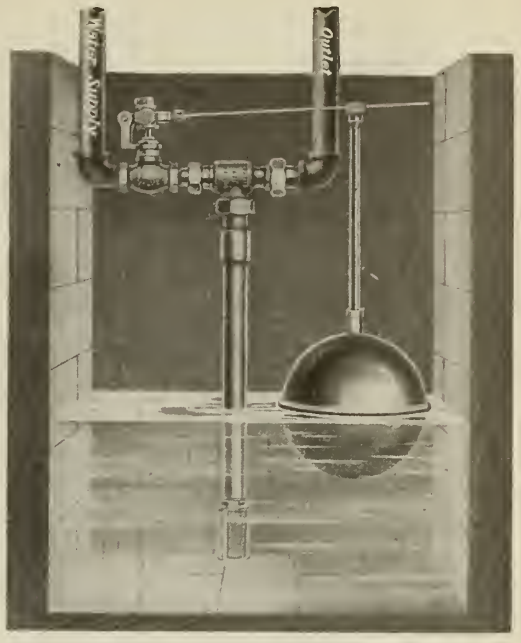
It's not necessary to have that basement of yours flooded every Spring. Why stand idly by and watch your stock being needlessly damaged and rapidly deteriorating in value?

Install a **Morrison Automatic Cellar Drainer.**

It will keep your cellar dry all the year round. It's easily installed, entirely automatic, all working parts are above water, operates at 10 lbs. water pressure and has no complicated cams or levers to get out of order.

Whether for your own use or to sell to your customers it will pay you to investigate the satisfactory, sure and perfect working qualities of the **Morrison Cellar Drainer.**

Dealers are making splendid profits selling them. May we send you complete information?



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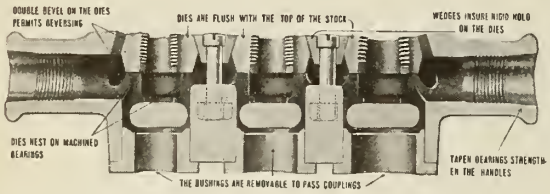
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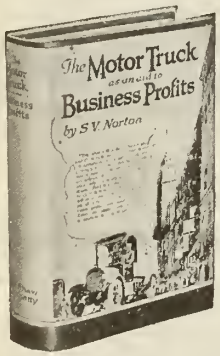

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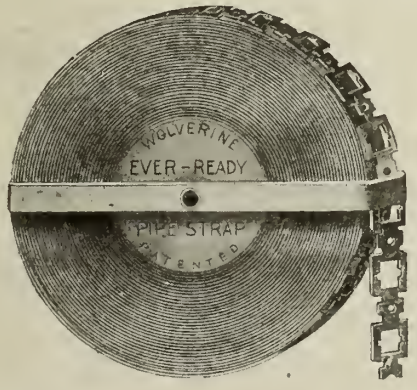

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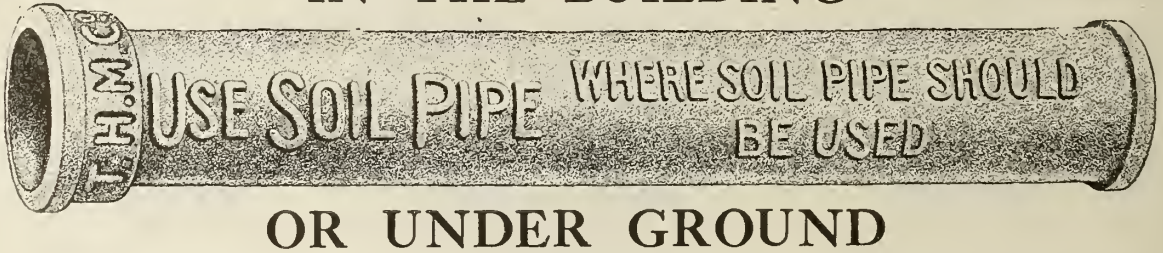

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INDEX TO ADVERTISERS

Amherst Foundry Co.....Inside Front Cover
A. & J. Mfg. Co..... 44
Anthes Foundry, Ltd. 33

Beaton & Cadwell..... 5
Beaton & Corbin..... 44
Borden Canadian Co..... 44
Breeden, Jos., & Co., Ltd..... 5

Can. Consolidated Rubber Co..... 39
Canadian Tube & Iron Co..... 44
Canadian Wolverine Co..... 37
Canada Metal..... 1
Chamberlain Desolvo Co..... 41
Consumers Metal Co. 44

Dominion of Canada..... 34
Dart Union Co.....Inside Back Cover
Dunham, C. A..... 3

Empire Manufacturing Co...Outside Ft. Cover

Galt Brass Co.....Back Cover and 9
Goodwin, F..... 35
Gummer, G. & W. G., Ltd..... 4

Hall, John H., & Son..... 43
Hause Mfg. Co., Chas. F..... 44
Hoyt Metal Co..... 42

International Malleable Iron Co..... 35

Jardine, A. B., & Co..... 7
Jenkins Bros..... 6

Kerr Eng. Co., Ltd.....Inside Back Cover
Katie Foundry Co..... 40

MacDougall & Co., R..... 43
McIntyre & Taylor, Ltd..... 43
Moline Heat..... 5
Morrison Brass Mfg. Co., Ltd., Jas..... 33
Mueller Mfg. Co., H..... 31

Port Hope Sanitary Mfg. Co..... 10

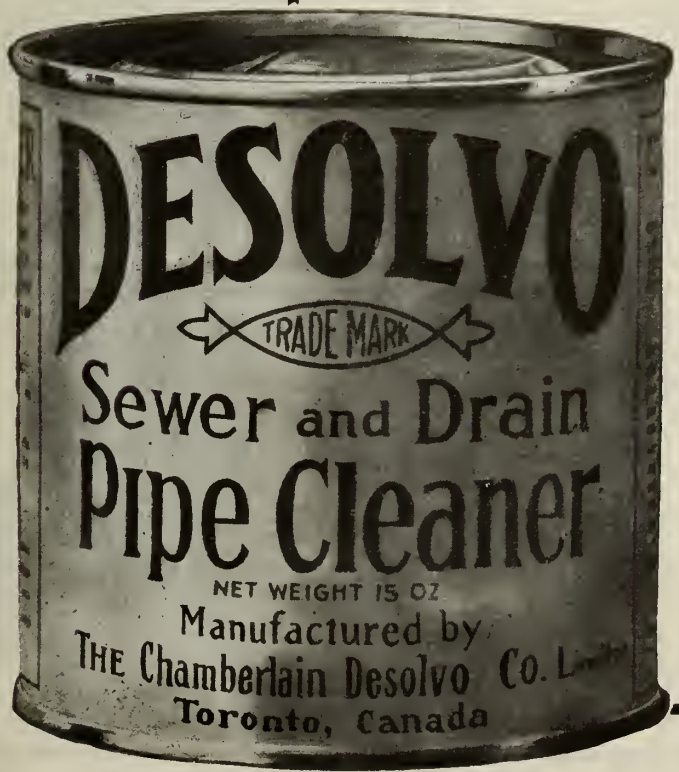
Scaife, W. B., & Sons Co..... 42
Standard Sanitary Mfg. Co..... 2
Steel & Radiation, Limited..... 6

Trimont Manufacturing Co..... 43
Toronto Hardware Mfg. Co..... 40

United Brass Founders & Engineers, Ltd. 42
United Brass & Lead, Limited..... 3

Warden-King, Ltd..... 34
Wallaceburg Brass Co..... 40
Wells Bros. of Can., Limited..... 36
Williams, J. H., & Co..... 7

A Better Job---In Less Time



That's what *Desolvo* will do for you. No need to use warm water.

It readily mixes with cold water. Better have a stock on hand for those emergency calls—when waste pipes are clogged. Will save you time and money and complete the work.

Your jobber has it.

The CHAMBERLAIN DESOLVO Co.
LIMITED
110 Church St., Toronto
General Offices - PITTSBURG, PA.

Steel Tanks for Every Purpose

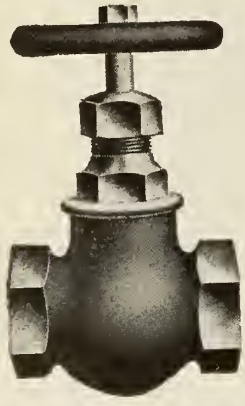
A FEW "SCAIFE" SPECIALTIES:

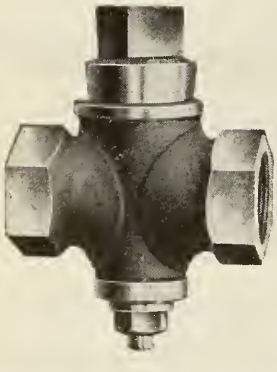
Air Receivers
Boilers—Hot Water
Expansion Tanks
Filters (water)
Hot Water Tanks
Hydro-Pneumatic Tanks
Range Boilers
Tanks (steel)
Water Supply Tanks

117 years old Founded 1802

WM. B. SCAIFE & SONS CO.

New York, N.Y. Office: 26 Cortland St. Home Office: Pittsburgh, Pa.





FIVE WORKS---OVER 3,000 EMPLOYEES

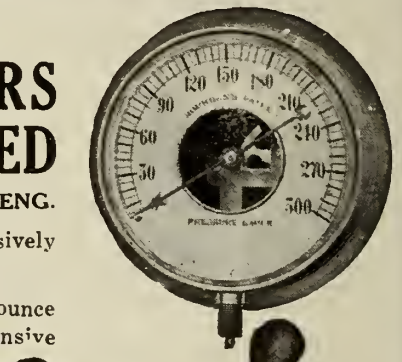
UNITED BRASSFOUNDERS AND ENGINEERS, LIMITED

EMPRESS FOUNDRY, CORNBROOK, MANCHESTER, ENG.

DURING THE WAR our Plants have been exclusively engaged on work of supreme national importance.

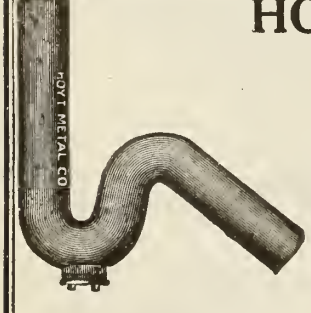
WITH PEACE IN SIGHT we are pleased to announce that we intend to again direct our energies to the intensive production of:—

GUNMETAL and BRASS VALVES and COCKS.
STEAM, WATER and COMPRESSED AIR FITTINGS GENERALLY.
CAST IRON STOP and SLUICE VALVES.
SEMI-ROTARY PUMPS.
EXTRUDED BRASS and BRONZE BARS.
BRASS BOLTS and NUTS, STUDS and GENERAL TURNED WORK FROM THE BAR.
CAST AND MALLEABLE IRON COCKS and PIPE FITTINGS.
PRESSURE and VAGUUM GAUGES.
INJECTORS and GENERAL JET APPLIANCES.
ENGINE GOVERNORS (Pickering, Proell, and Other Types).
SPRAYING MACHINES, for Insecticides and Lime-washing.
COPPERSMITHS' WORK.
"STELLA" BRAND ALLOYS: MANGANESE COPPER, SILICON COPPER, FERRO ZINC, PHOSPHOR COPPER and TIN, etc.



"UBEL" POST-WAR SERVICE

If you are interested in any or all of the lines mentioned, and are in a position to take a hand in the energetic distribution of the same, please communicate with us NOW to our Head Office, at above address.



HOYT METAL GOODS ARE KNOWN

FROM COAST TO COAST

As time-savers there are none equal to our Wiping Solder, Bar or Wire Solder.

Hoyt Lead Traps, bends and waste pipe are in a class by themselves.

All our products are made to formula.

Our Mixed Metal Sales Amount To Over $5,000,000 Annually.

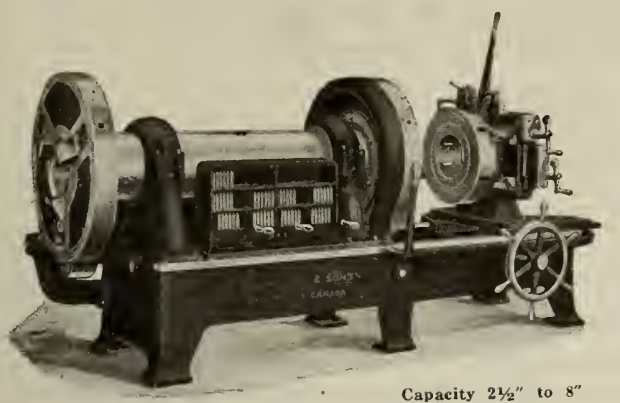
Write your Jobber

HOYT METAL COMPANY, TORONTO, ONTARIO

New York, N. Y., London, Eng., St. Louis, Mo.

Write Us

Pipe Machines of Merit



Capacity 2½" to 8"

THE HALL No. 8

Duplex Improved Gear Box Driven. Capacity 2½ in. to 8 in. inclusive

Note the drive belt at rear out of operator's way. Elevated die cabinet, control lever and speed levers all convenient to operator's right hand. Sliding die head.

These machines are equipped with a friction clutch, enabling operator to revolve pipe a few inches, if necessary.

Pipe Machines ranging from ⅛ to 18".
Nipple Machines ranging from ⅛ to 4".
Roller Pipe Cutters ranging from ⅛ to 4".

Delivery from stock.

Write us for full particulars and prices.

John H. Hall & Sons, Ltd., Brantford, Can.

The Wrench of 25% Greater Efficiency

TRIMO PIPE WRENCH

Two new features have been recently added to the Trimo Pipe Wrench, namely Nut-Guards, in all sizes, and unbreakable steel frames, in leading sizes.

The Nut-Guards prevent the accidental rotation of the nut while in use.

These improvements add 25% to the usefulness of the tool.

The Trimo Pipe Wrench is made with wood handles in 4 sizes, 6-in., 8-in., 10-in., 14-in. and in steel handles in all sizes, 6-in. to 48-in. inclusive.

All Trimo Pipe Wrench parts are interchangeable.

The inserted jaw in the handle can be readily replaced when worn, thus adding to the life of the tool.

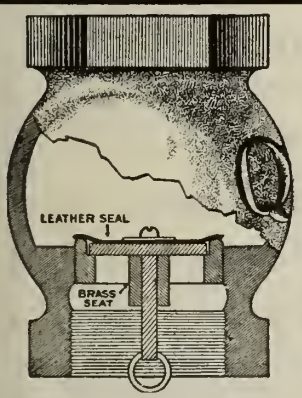
Nut with Nut-Guards

Inquiries from Importers and Dealers Solicited. Send for Catalogue No. 55.

TRIMONT MANUFACTURING CO.

Cable Address: Triwrench
Code: Western Union

Roxbury (Boston) Mass., U.S.A.



This is a "Q" Foot Valve

And it Just *CAN'T* Leak

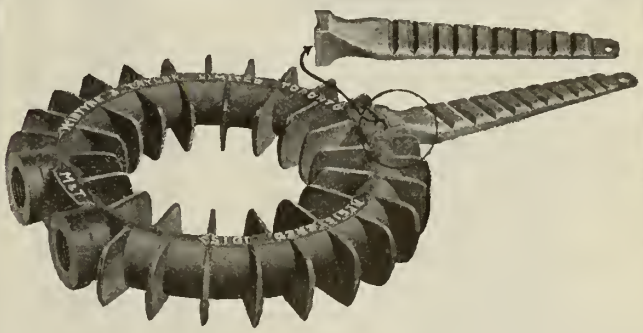
There are more pump troubles caused by "leaky" valves than from all the wear and tear which occurs in the average life of a pump.

The "Q" valve will overcome all priming troubles, and water once raised above it, through the suction line, will not leak out.

If you want the pumps you instal to give maximum, you will require to use the only valve on the market that JUST CAN'T LEAK.

Made in sizes from 1 to 8-inch.

R. MACDOUGALL CO., LTD.
GALT., CANADA



MORE HEAT!

This is our No. 15 Boiler Coil. Extreme dia. 13". Has a large heating surface allowing for a maximum efficiency. Very easily installed and lasts an unusual length of time.

If your jobber cannot supply you write us direct.

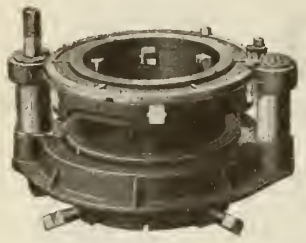
McIntyre & Taylor Limited

Toronto Montreal Winnipeg

A GOOD HUSKY BOY

will thread 2½ to 4-inch pipe easily

Make Hard Work Easy and Save Time



Beaver No. 41 Threads 2½, 3, 3½ and 4-inch Pipe Without Changing Dies.

One set of dies will thread all sizes, from 2½ to 4 inches, and is adjustable to cut standard, oversize, or undersize, insuring tight-fitting joints regardless of any variation in fittings.

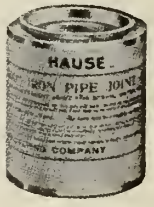
Just take a look at the construction of Beaver No. 41. The threaded barrel or leader screw is a separate casting from the head to minimize repair expense; gears are protected; driving pinion is supported at both ends; bronze bushings and steel castings insure longer life. Only one set of dies to buy and these may be re-ground on a grindstone.

THE BORDEN-CANADIAN COMPANY
TORONTO, CANADA

SAVE YOUR COUPLINGS

Write us what you have of the various sizes, either in pieces or pounds, and we will make you a cash price on them.

The A. & J. Mfg. Company
559 West Lake St. Chicago, Ill.



Chas. F. Hause Mfg. Co., Ltd.
Manufacturers of
Iron Pipe Joint Cement
SETS LIKE GUM
ALLOWS NO LEAKS

Liquid and Powder Form.
Packed in 1-lb., 5-lb., 15-lb., 25-lb., 50-lb. cans; 100 and 250-lb. barrels. Ask your jobber for prices or write us direct.
Made in Omaha, Neb., U.S.A.
Canadian Distributors:
EMPIRE MANUFACTURING CO., LIMITED
LONDON AND TORONTO

No. 1 B. & C. Automatic Radiator Air Valve

Made from the best brass with cast brass base. Screwed and soldered on, and equipped with high grade carbon. All valves tested before shipping. Use these together with our famous "B & C" Floor and Ceiling Plates and insure satisfaction.

The Beaton & Corbin Mfg. Co.
Southington, Conn.
Stocks carried by our Canadian Representatives
Canadian Representative: W. H. Cunningham & Co
183 Church Street - - Toronto, Ontario

Second-Hand Pipe

1-2" to 4"
Black and Galvanized
Send us list of your requirements

Consumers Metal Company, Limited
14 St. John Street, MONTREAL
Works: LACHINE, QUE.

WROUGHT PIPE

BLACK and GALVANIZED SIZES, 1/8 IN. TO 4 IN.

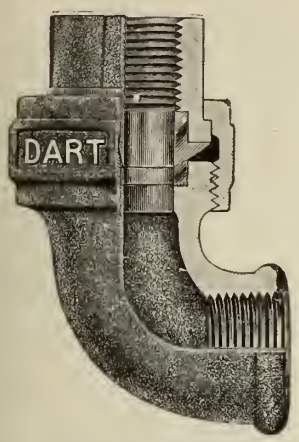
All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

All Sizes of NIPPLES (Black and Galvanized)

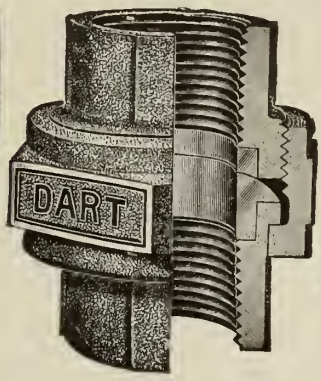
Ask your jobber for CT *Brand of Wrought Pipe*

CANADIAN TUBE & IRON CO., LIMITED, MONTREAL
Works: Lachine, Can.

DART Union Pipe Couplings



Cut above shows the Dart Union Elbow. By its use you save two threads, do neater work and make sure that the connection is trouble-proof.



BRONZE
Face and Seat

Easy to Use *Never Loosen Up*

It is surprisingly easy to make connections with Dart Unions. The Ball-Shaped Seat enables you to make a perfect joint without the slightest bother regardless of the alignment of the pipe.

The Joint is Bronze against Bronze. This makes deterioration at the vital part impossible.

And the pipe ends and nuts being extra heavy, there is ample strength to prevent stretching or pulling apart under unusual strain or heavy pressure

Dart Union construction means a saving of time for you and satisfactory service to customers.

ORDER FROM YOUR JOBBER

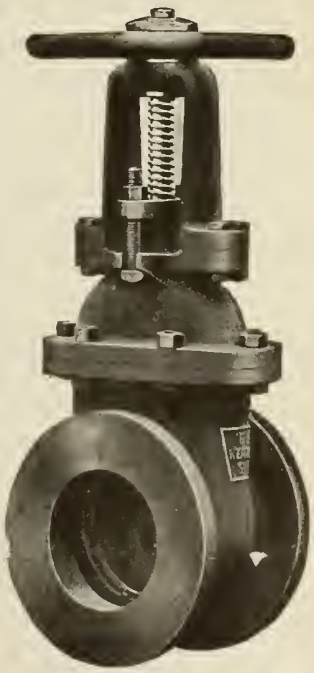
DART UNION COMPANY, LIMITED
TORONTO, CANADA

There Are Lots of Gate Valves

Advertised and Sold

but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.
Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.
Approved by the Fire Underwriters' Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

EVERY FITTING TESTED

EVERY TANK GUARANTEED

Reduce Your Troubles

Install a *VitrO Tank and Closet* on your next job.

The *VitrO Tank* is the most modern development of tank manufacturing. All in one piece—no lining to get out of order and cause endless trouble. *VitrO Tanks* that were installed ten years ago are still without the evidence of a leak. *Nearly half a million now in use.*

If it's worth anything to you to install satisfactory goods then write us for our VitrO Catalogue. It illustrates the greatest money-making lines of plumbers' supplies on the Canadian market to-day.

Galt Brass Company, Limited

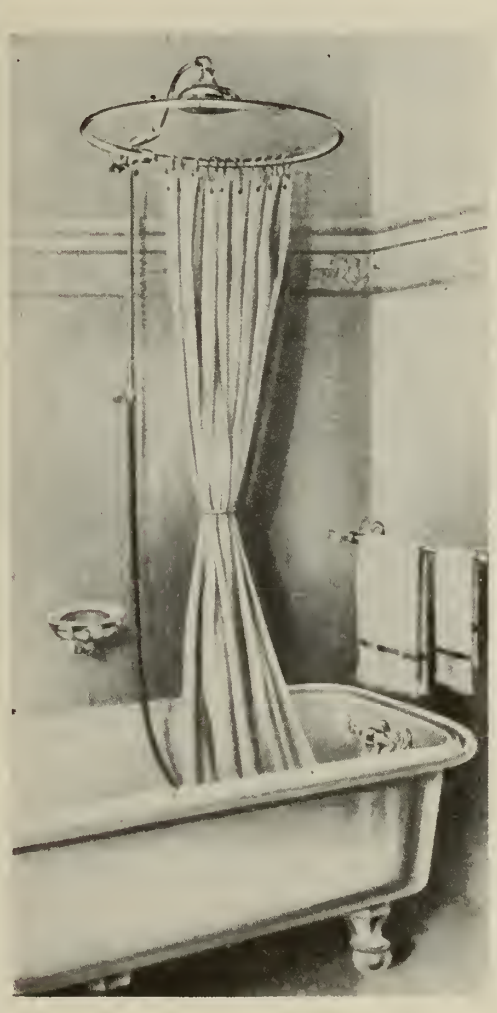
Galt, Canada

Sanitary Engineer

Plumber and Steamfitter of Canada

VOL. XIII. PUBLICATION OFFICE, TORONTO, APRIL 15, 1919 No. 8.

Wear-Proof Bathroom Supplies



BATHROOM facilities, luxuriously designed, or plain, no matter which, we supply them. Our lines are absolutely complete.

Bathrooms are not a luxury or a source of extravagance, but a lasting investment. Every householder knows this, and only needs to be informed of the great improvement made in the manufacture and appointments of this line.

Our literature and catalogues contain very valuable information as to what has been done in the development of these lines to their present degree of perfection. Every plumber and sanitary engineer should have this information; it helps him to properly advise his clients, and gives him an adequate idea of the great service we can render him in supplying every need promptly. Our lines are wear-proof.

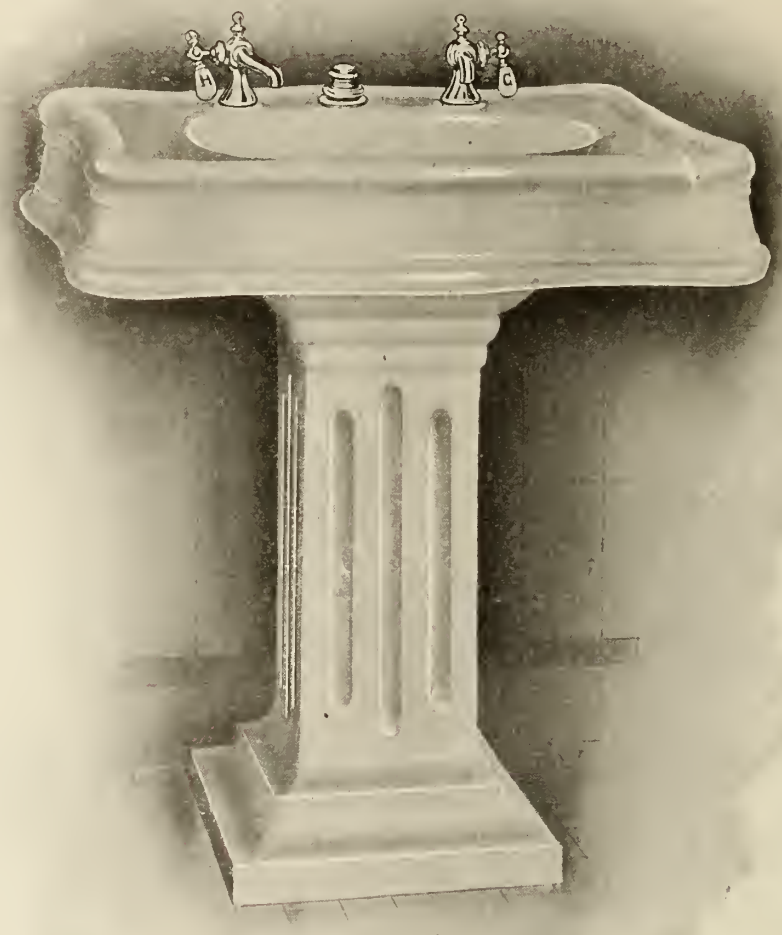
No matter what you want in the way of bathroom and toilet supplies, heating facilities, water pressure system—we can supply your needs.

Write us.

EMPIRE MANUFACTURING CO., LIMITED

LONDON AND TORONTO, CANADA

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While



A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for **BEAVER BRAND CAST IRON ENAMEL WARE**

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

ONTARIO:
Monarch Brass Mfg. Co., 71 Brown St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes, 120 Lombard St., Winnipeg

The Septic Tank is the Farmer's Greatest Convenience

Specify "ANTHES" and you can be sure of absolute satisfaction

Now is the time to get after your farmer customers. They have the money to install a plumbing system, and it is only necessary to point out to them the great conveniences it will give them to get their order. We are advertising extensively in Farm Journals, and the great number of inquiries from all over the country indicate that hundreds of farmers are contemplating installing plumbing systems.

ASK US FOR INFORMATION. WE WILL SUPPLY YOU WITH CIRCULARS TO GIVE TO PROSPECTIVE CUSTOMERS.

We will furnish you with Septic-Tank blue prints on request.

We have received inquiries from the following towns: Walkerton, Oakdale, Listowel, Brockville, Fonthill, Lindsay, Fullarton, Cobden, Streetsville, and many others. If you are established in any of these places write us, and we will give you the names of the parties inquiring.

We have made a sweeping reduction in the prices of soil pipe and fittings, which was noted in the last issue of Sanitary Engineer. This should stimulate buying, and you might as well get out for your share of the business. Two of our newest lines in soil pipes are noted below.

WE ARE NOW MAKING A NEW LINE OF

LIGHT SOIL PIPE AND FITTINGS

Prices for which will be furnished on request.

ALSO

FLAT HUB MEDIUM PIPE AND FITTINGS

Which are the same price as the ordinary medium pipe and fittings

Ask your jobber for "ANTHES" Syphons, soil pipe and fittings.

ANTHES FOUNDRY, LIMITED

TORONTO and WINNIPEG

SANITARY ENGINEER, April 15th, 1919, Vol. XIII., No. 8. Published 1st and 15th of every month at 143-153 University Ave., Toronto, by The MacLean Publishing Co., Ltd. Yearly subscription price, Canada, $1.00; United States, $1.50; Great Britain and the Colonies, 4s. 6d.; elsewhere, $2.00. Entered as second-class matter at the Post Office Department, Ottawa. Entered as second-class matter July 1st, 1912, at the Post Office at Buffalo under the Act of March 3rd, 1879.

MALLEABLE AND CAST IRON PIPE FITTINGS

The Brand That Has The Quality

"Quality" and "Reliability" are two essentials demanded of *Cast Iron* and *Malleable Fittings*, by all sanitary and heating engineers.

Time and money are lost by improperly made fittings. All our cast iron and malleable fittings are properly recessed and every fitting bears the above trade-mark of quality.

We make a complete and full line of both flanged and threaded fittings from ⅛-inch up, and can make deliveries from stock, both standard and extra heavy.

When ordering from your jobber be sure you buy---"the brand that has the quality." They are different. A trial order will convince you.

International Malleable Iron Company, Limited

Guelph, Ontario, Canada

Over 60,000 Daisy Hot Water Boilers Now in Use—Are *You* Selling Your Share?

LONG SERVICE

LASTING SATISFACTION

Daisy Boiler No. 5

Daisy Hot Water Boilers are easiest to sell because they have an established reputation for exactly meeting the requirements of the modern home.

Every Daisy you instal will help build bigger business by bringing repeat orders for installation in neighboring homes later.

WARDEN KING Limited, Montreal

BRANCH OFFICE: 136 SIMCOE ST., TORONTO

FOR SALE

Sanitary and General Ware Pottery at Trenton, N. J.

This plant is **Completely Equipped** to manufacture either **Sanitary Ware** or **General Ware,** including the world-famous **Belleek China.**

This is the greatest Pottery bargain ever offered.

Can be purchased **intact** for less than one-quarter its value.

A general idea of the plant and equipment can be gotten from the following:

1. Plant is built on a 3½ acre site.
2. Has approximately 300,000 square feet floor space.
3. Contains:
   - One 20-ft. kiln.
   - Ten 18-ft. kilns.
   - Two 16-ft. kilns.
   - Four 8-ft. decorating kilns.

P.R.R. Siding **Canal Facilities** **Excellent Labor**

For Price, Terms and Full Particulars Address

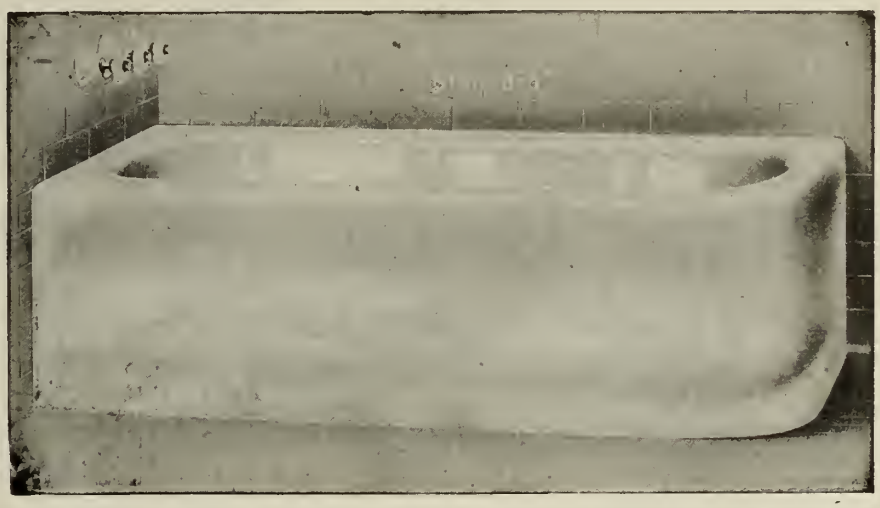
LEUCKEL & PLANE

1476 Broadway, N. Y. C.

Telephone Bryant 9377

"Standard"
"Perfection" Built-In Baths

Made in One Piece Enamelled All Over



These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners meaning bathroom sanitation.

Made in 5 and 5½ foot sizes.

Illustrations on request.

Write the nearest dealer

Standard Sanitary Mfg. Co.
Limited

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Toronto Store:
55-59 Richmond Street East

Winnipeg Showrooms:
76 Lombard Street

Hamilton Store:
20-28 Jackson Street West

Montreal:
4 Beaver Hall Square

Calgary:
31 Canada Life Building

Vancouver:
847 Beatty Street

"MADE IN CANADA"

QUALITY, EFFICIENCY and SERVICE

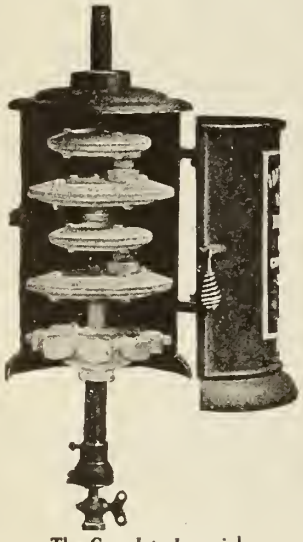
Insured by our trade mark

Shipment the day orders received

Canadian Brass Company

Limited

Galt **Toronto**



The Complete Imperial Water Heater

BY installing "IMPERIAL" heaters, you serve your customers' interests, as well as your own.

"IMPERIAL" heaters, are made in three sizes, for the ordinary, heavier, or heaviest requirements.

PERFECT HEAT baffling. Absolute water CIRCULATION.

Sectional View Showing Water Flow

POWERFUL. ECONOMICAL.

For either ARTIFICIAL or NATURAL Gas.

IMPERIAL CITY HEATERS, LIMITED

SARNIA, CAN.

When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER.

PLUMBER'S RUBBER SUPPLIES

No matter what the need of Plumber's Rubber Supplies may be, the Dominion Rubber System can supply it to the best advantage. The Dominion Rubber System range is complete in every detail—

From the smallest Washer to the largest Gasket.
Rubber Force Cups in assorted styles.
Rubber Flush Balls.
Rubber Closet Bends and Connections.
Feather Edge and Syphon Valve Washers.

The nearest Dominion Rubber System branch will gladly give quotations if your jobber cannot supply you.

Dominion Rubber System Service Branches

are located at:

Halifax, St. John, Quebec, Montreal, Ottawa,
Toronto, Hamilton, London, Kitchener, North Bay,
Fort William, Winnipeg, Brandon, Regina, Saskatoon,
Edmonton, Calgary, Lethbridge, Vancouver, Victoria.

CANADIAN CONSOLIDATED RUBBER CO. LIMITED — DOMINION RUBBER SYSTEM — AND ASSOCIATED COMPANIES

WROUGHT PIPE

BLACK and GALVANIZED
SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

All Sizes of NIPPLES (Black and Galvanized)

Ask your jobber for CT *Brand of Wrought Pipe*

CANADIAN TUBE & IRON CO., LIMITED, MONTREAL
Works: Lachine, Can.

PIPE AND THE PUBLIC WELFARE

By R. C. McWANE

A Book Just Off the Press

Every sanitary engineer should be the possessor of this book. It deals with pipe-making of all kinds, cast iron, wrought iron, steel, wood and tile pipe. It is valuable because it gives the users of pipe a true idea of how pipe lasts under various conditions when in service.

Price $1.00 Postpaid

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G. & W. G. GUMMER, LIMITED

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ROTHERHAM,
ENGLAND

And at
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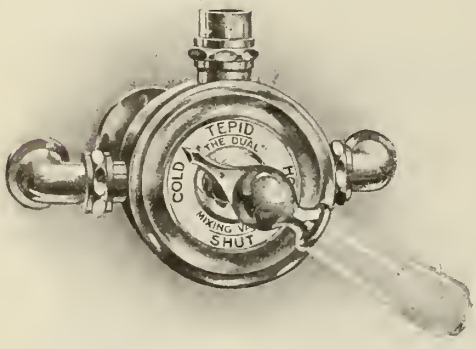
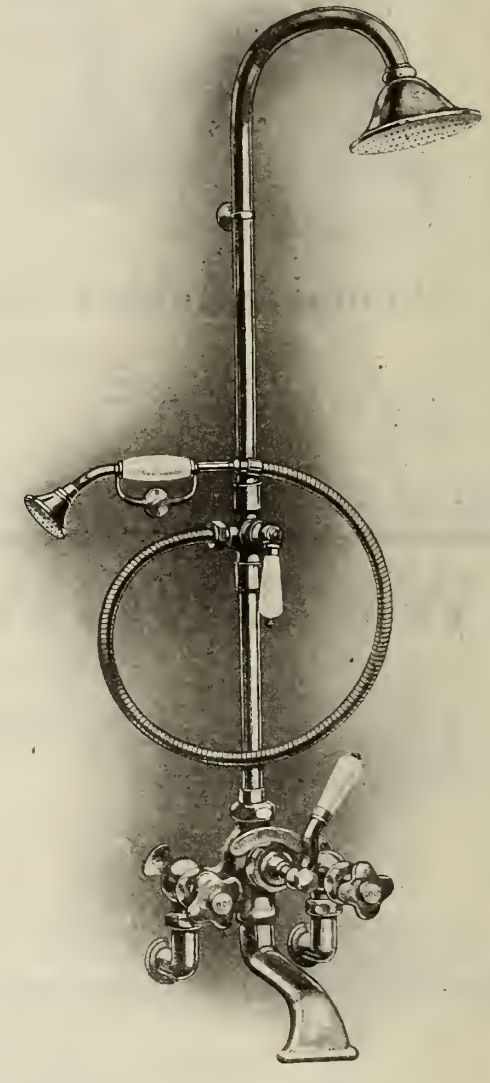
London





"Dual" Mixer

A valve that really mixes Hot and Cold Water, and maintains a uniform mixture.

For ease of operation, simple construction and easy installation, it has set a new standard of efficiency.

Cold Water must be turned on first, no possibility of scalding.

Made in several forms for Showers, Sprays, Operating Rooms, etc.

At the well-known works of Messrs. Brunner, Mond & Co. these valves provide baths for 2,500 employees.

G. & W. G. GUMMER, LIMITED

Manufacturers of every description of

Engineers,' Plumbers' and Sanitary Quality Brassware

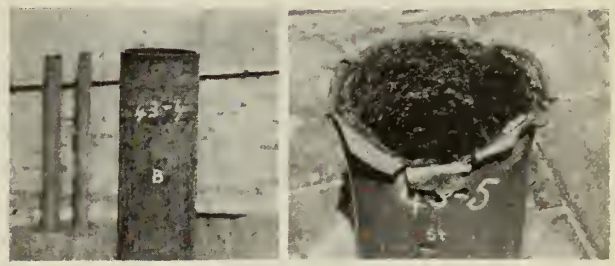
BYERS PIPE

GENUINE WROUGHT IRON FULL WEIGHT GUARANTEED

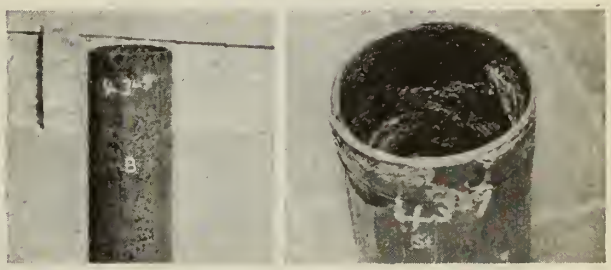
A $3,000.00 Saving Turned into a $100,000.00 Loss

A homely illustration of the difference in rust-resistance between Byers and other pipe, is furnished by the photographs on this page. As Byers pipe *looks* exactly like any other pipe, it has frequently happened that different kinds of galvanized or black pipe have been mixed up and installed in the same building, as shown. (Name on request.)

The *same* service, the *same* age, *identical* conditions of corrosive attack—yet how differently these pipes turned out after being put to the test of time and service! The building is still young—but the inferior pipe soon will have to be replaced at a terrific cost.

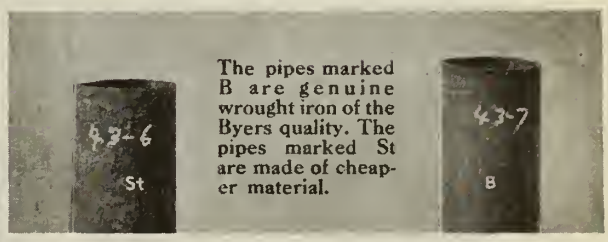


In a certain large metropolitan building, the initial saving effected by using pipe cheaper than Byers was $3,000.00. The total cost of the pipe *installed* was $45,000.00. Replacement started after five years, and has been continued ever since. The total ultimate replacement cost will exceed $100,000.00. The case is typical.



In residences and smaller buildings, ten or twenty dollars initially saved by using pipe cheaper than Byers, may later cause failures costing several hundred dollars.

In hundreds of buildings investigated, genuine wrought iron pipe of the Byers quality after 20 to 40 years' service has been found depreciated less than 10 or 15 per cent, while other pipe in the same and nearby buildings has occasioned costly pipe replacements after only five or ten years' service, the failures increasing from year to year as the buildings grow older. Illustrated literature on request.



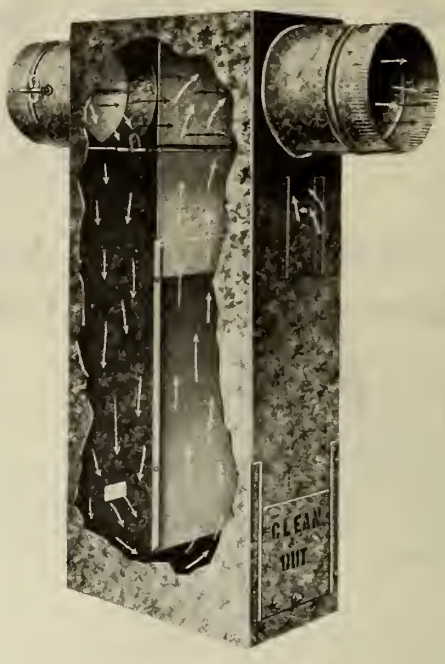
The pipes marked B are genuine wrought iron of the Byers quality. The pipes marked St are made of cheaper material.

A.M. BYERS COMPANY
Established 1864 ~ PITTSBURGH-PA.
New York ~ Boston ~ Chicago ~ Dallas
Distributors in all large jobbing centers

Byers Pipe has the Name and Year rolled in every length

Here It Is!

THE THERMOS FUEL SAVER AND HEAT INTENSIFIER



Causes the retention of combustible gases in the fire chamber, thereby ensuring complete combustion.

Thus creating a greater heat efficiency from much less fuel.

Guaranteed to save 25% to 75% of the fuel bills.

This device will ensure register pipes to be warmer than smoke pipes.

The reverse is now the rule.

Retails $15.00

Write for dealers proposition.

Live representatives can make big money selling this device.

Agents wanted in every City, Town and Village in Canada.

Selling rights granted and protected.

Installed in fifteen minutes.

Further information WRITE

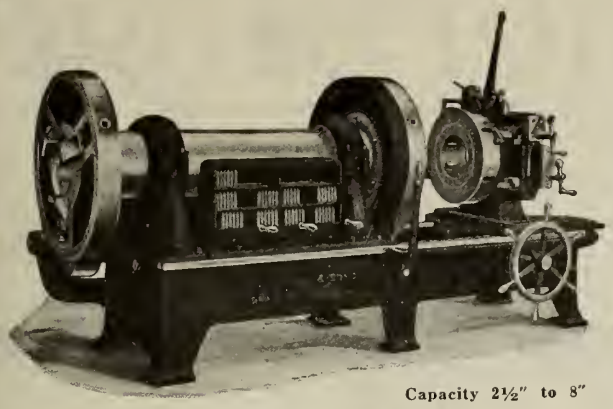
Heating Specialty Co.

Limited

505 Queen St. West TORONTO, ONT.

Sole Agents for Canada

Pipe Machines of Merit



Capacity 2½" to 8"

THE HALL No. 8

Duplex Improved Gear Box Driven. Capacity 2½ in. to 8 in. inclusive

Note the drive belt at rear out of operator's way. Elevated die cabinet, control lever and speed levers all convenient to operator's right hand. Sliding die head.

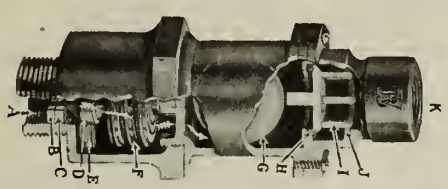
These machines are equipped with a friction clutch, enabling operator to revolve pipe a few inches, if necessary.

Pipe Machines ranging from ⅛ to 18".
Nipple Machines ranging from ⅛ to 4".
Roller Pipe Cutters ranging from ⅛ to 4".

Delivery from stock.

Write us for full particulars and prices.

John H. Hall & Sons, Ltd., Brantford, Can.



OLD DOC BV

Cures Sick Systems

Relieves the System of Air and allowes no water or vapour to escape.

The BV Air Eliminator

Bottum Valve Company

213 W. Schiller Street,
CHICAGO, ILL.

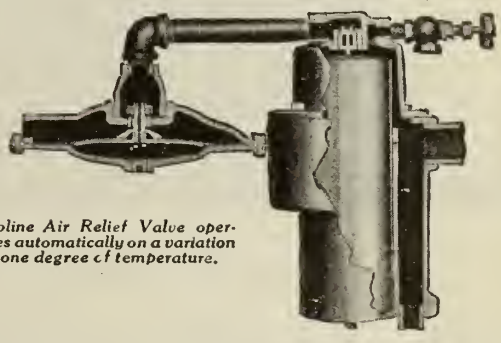
"You're exactly right, Bill— *in heating installation, it's* QUALITY *that counts!"*

"YES, partner, we have certainly had that truth pounded into us over and over in the twenty years that we have been in the heating contracting business. Haven't we seen one heating contractor after another lose customers simply because he tried to cut the price and thereby was obliged to skimp on quality?"

"You bet! It has certainly paid us to bid on Moline Heat every time!"

"Of course it has! You and I have always kept in mind the fact that a contractor is not through with a customer when he has finished the installation. If a contractor does a poor job, that means that the customer will complain to others. If he does a good one, one that gives PERMANENT satisfaction, that means the customer will praise his work and help him to get other customers. You simply can't get away from that rule!"

"That's the very reason we landed this contract and all the others we have landed in the past ten years, since we began installing Moline Heat. You can't fool a customer. HE knows what good heating should be."



Moline Air Relief Valve operates automatically on a variation of one degree of temperature.

"And that's why Moline Heat pays. It pays the customer, it pays the heating contractor. Quality counts!"

Add to your bank account and good reputation.

For full particulars, write to us today.

Some excellent territory still open for special sales representatives.

Address Dept. G.

Moline Heat EVERYWHERE

Moline Illinois

The Publisher's Page

TORONTO APRIL, 1919

SANITARY ENGINEER is one of the fifteen MacLean papers.
The MacLean papers, being editorially efficient, command the confidence of their readers, thus making them most effective as a factor in well-planned advertising campaigns.

Complete List of Publications

TRADE NEWSPAPERS

Hardware and Metal — Canadian Grocer — Dry Goods Review
Men's Wear Review — Bookseller and Stationer — Sanitary Engineer

TECHNICAL PAPERS

Canadian Machinery — Canadian Foundryman — Marine Engineering
Power House — Printer and Publisher

MAGAZINES

MACLEAN'S MAGAZINE — FARMERS' MAGAZINE

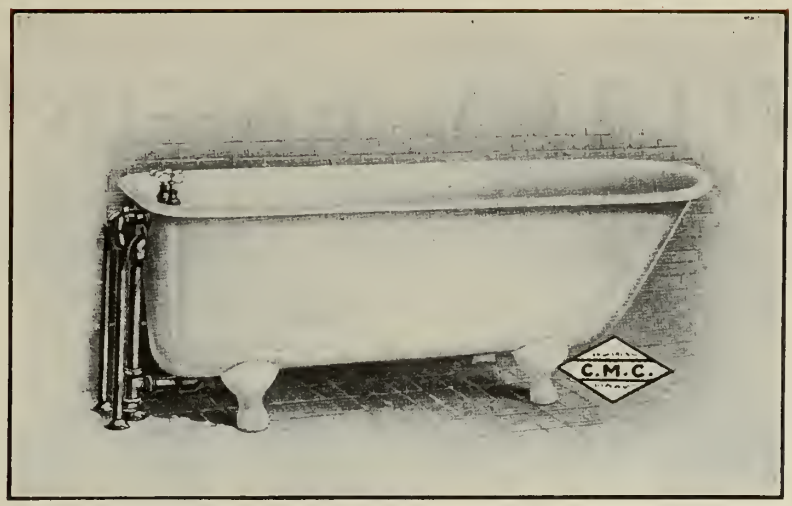
Financial Post—*Weekly commercial newspaper.*

The MacLean Publishing Company, Limited

143-153 University Avenue - - TORONTO

Largest Publishing House in Canada

Superior Service



Dependable Quality

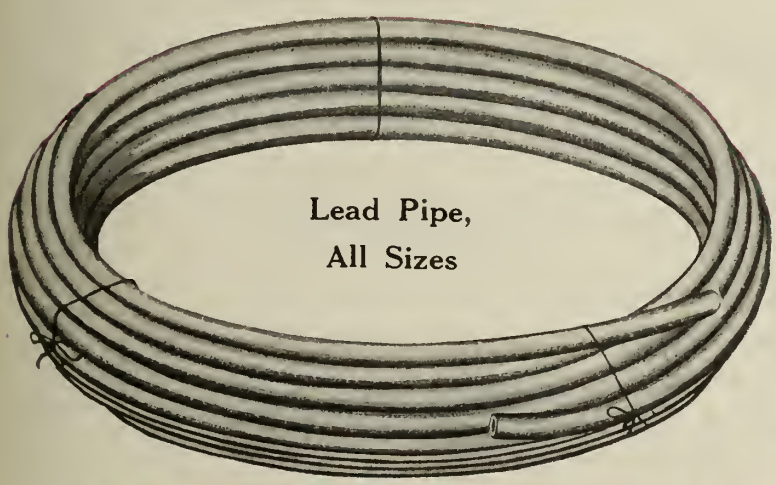
Headquarters for Plumbers' Supplies!

BATHS, LAVATORIES, SINKS, ARISTOCRAT LAUNDRY TUBS

TRAPS, AND BENDS, EASY WIPING SOLDER

IRON PIPE AND FITTINGS ALL BRASS GOODS

LEAD PIPE, SHEET LEAD, SOLDER, BLOCK LEAD, ETC.



Lead Pipe, All Sizes

We Ship Promptly

Write for Catalogue "A"—It's Free

THE CANADA METAL CO., LIMITED

TORONTO, CANADA

HAMILTON MONTREAL WINNIPEG VANCOUVER

SANITARY ENGINEER

PLUMBER AND STEAMFITTER OF CANADA

ESTABLISHED 1907 PUBLISHED TWICE MONTHLY

Vol. XIII. APRIL 15, 1919 No. 8

CONTENTS

Making Use of Satisfied Customers ...	17-18	Heating and Ventilating Dept.	32-33
Features For Next Issue	18	Comparative Standards	32-33
Displays That Attract Sales (Illustrated)	19-20	Income Tax Days (Cartoon)	33
Peter & Sylvester Show Rooms	19-20	Ventilating the Modern School	34
Discussions at Ontario Convention ...	19-25	Sees Busy Season Ahead	35
List of New Officers	21	Labor Cost Plumbers' Problem	36
Complete Convention Reports	19-25	Current Events in Photograph	36
Doubles Business in Five Years	26-27	New Canadian Patents	37
J. H. Ashdown Dept. (Illustrated)	26	The Sanitary Engineer, His Wants and How to Supply Them	38
Practical Sheet Metal Course	28	The Question Box	39
What About the Slow Pays?—Suggestions For Collection Letters	29	News From Here and There	40-41
EDITORIAL COMMENT—A Safe Margin—Honesty Pays—Oust the Sale-Killers—A Costly Waste—Keep Business Moving—Value of Associations—The Housing Scheme—Tact is Needed—Shortening Credit Terms	30-31	On the Side	41
		Larger Loans For Better Homes	42
		Why My Men Are Loyal	43-45
		England Will Favor Colonies	45
		Many New Bills Affect Retailers	46
		New Goods	47
		Market Conditions and Tendencies	48-50

The MacLean Publishing Company, Ltd.

JOHN BAYNE MACLEAN, *President.* H. T. HUNTER, *Vice-President.*
H. V. TYRRELL, *General Manager.*

Publishers of Sanitary Engineer, Hardware and Metal, The Financial Post, MacLean's Magazine, Farmers' Magazine, Canadian Grocer, Dry Goods Review, Men's Wear Review, Printer and Publisher, Bookseller and Stationer, Canadian Machinery and Manufacturing News, The Power House, Canadian Foundryman, Marine Engineering of Canada.

Cable Address: Macpubco, Toronto: Atabek, London, Eng.
ESTABLISHED 1887

Sanitary Engineer, Plumber and Steamfitter of Canada

Published on the First and Fifteenth of Each Month

CHIEF OFFICES:

CANADA—Montreal, Southam Bldg., 128 Bleury St., Phone Main 1004. Toronto, 143-153 University Ave., Telephone Main 7324. Winnipeg, 1207 Union Trust Bldg., Telephone Main 3449.

GREAT BRITAIN—London, The MacLean Company of Great Britain, Limited, 88 Fleet Street, E.C., E. J. Dodd, Director, Telephone Central 12960. Cable Address: Atabek, London, England.

UNITED STATES—New York, A. R. Lowe, Room 620, 111 Broadway, Telephone Rector 8971; Boston, C. L. Morton, Room 734, Old South Building, Telephone Main 1024; A. H. Byrne, Room 900, Lytton Bldg., 14 E. Jackson Street, Chicago, Phone Harrison 1147.

SUBSCRIPTION PRICE—Canada, $1.00 a year; Great Britain, South Africa and West Indies, 4s. 6d. a year; United States, $1.50 a year; other countries, $2.00 a year; Single Copies, 10 cents. Invariably in advance.

TRADE PERFECTO MARK

The Better Brass Goods?

In supplying **"Perfecto"** Brass Goods to your customers you are giving them the best. They give service, satisfaction and a long period of usefulness.

You protect yourself and your customers' interests when you sell **"Perfecto"** Brass Goods. They cost no more than inferior products.

OUR GUARANTEE:

Any article of our make proving defective through inferior metal or improper workmanship, on our part, will be replaced with TWO good ones, at NO CHARGE to you.

GALT BRASS COMPANY, Limited

GALT, ONTARIO

TRADE PAPER ADVERTISING

A Plumber in Toronto asked me why we did not devote all our advertising space to telling about the merits of PORT HOPE enamelware. He was good enough to speak highly of its quality, and said that he used it exclusively because it gave his customers such good satisfaction. Here is the answer.

The "Sanitary Engineer" is a Trade paper, its circulation is altogether amongst those who instal or who are interested in Plumbing work, and the majority of whom know from Catalogues and printed literature, the type and pattern of fixtures we make in our Port Hope Factories, and from a satisfied experience know the quality of goods we supply.

Advertising in a Trade paper would thus only reach those who are already well informed; it would only cater for business that has already been placed by contract and which could not be increased; in short, we would only bid for a share of the Plumbers' business.

A Trade paper to our mind is, or should be, for an entirely different purpose. Those who are in the Plumbing business, either as Manufacturers, Distributors, or Contractors, should use it as a medium for the exchange of ideas, always having in view the promotion and development of a bigger and better business, by creating a greater demand among householders for sanitary plumbing and modern bath-rooms.

It can be done by co-operation, and a healthy, helpful and vigorous campaign on the part of all who are interested would produce wonderful results. Would you like to express your views on the subject?

Port Hope Sanitary Mfg. Company, Limited

Factory:
PORT HOPE, ONTARIO

Head Office:
ROYAL BANK BUILDING, TORONTO

TORONTO SHOWROOMS
119 King St. East

WINNIPEG OFFICE
405 Tribune Bldg.

MONTREAL SHOWROOMS
234 Beaver Hall Hill

HALIFAX OFFICE: McCurdy Building, Hollis Street.

Established 1907 Circulates Throughout Canada

Sanitary Engineer
Plumber and Steamfitter of Canada

Published First and Fifteenth of Month

Vol. XIII TORONTO, APRIL 15, 1919 No. 8

Making Use of Satisfied Customers

Regina Firm of Sanitary and Heating Engineers Make Practical Use of Testimonials From Satisfied Customers—Names, Addresses and Letters Reproduced in Advertisements

Written especially for "The Sanitary Engineer, Plumber and Steamfitter of Canada"

THERE is an old saying that a satisfied customer is one of your best advertisements. It is true to a certain extent but the value of the satisfied customers as an advertisement depends largely upon the extent to which the merchant uses the customer as an advertisement.

There are hundreds of customers, who when they buy a new home, a new car, a new heating system, etc., do not object in any way to the firm from whom they secured their purchase using their name when approaching other customers. In fact in many cases the original purchaser is rather pleased when the merchant points out that Mr. So and So in the next block or on the next concession is one to whom the merchant can point with pride as a satisfied customer.

Many of the most successful salesmen who do business in a big way carry with them photographs or drawings of installations or work which have been done by their firms in various parts of the country, and in this way by actually showing or demonstrating how the goods are being successfully used they can more readily convince their customers and land the order.

How Regina Firm Works

Working on this principle, Wagg, Wilson & Co., sanitary and heating engineers, Regina, Sask., are making excellent use of their satisfied customers.

On this page you will note two reproductions of advertisements which have appeared in Regina newspapers. One of these advertisements reads: "A modern plumbing and hot water heating system with a special tank system of sewage disposal will make your rural home complete. We will instal you a septic tank system of sewage disposal that is absolutely guaranteed. You need have no doubt about it working. We are not making an experiment at your expense, as we have them installed and working, not one, but many. Enquire from some of our rural customers listed below and get their opinion on the systems we have installed for them."

List of 40 Customers

Then follows a list of 40 satisfied customers to whom prospects are referred for opinions of the systems installed by Wagg, Wilson & Company. An advertisement of this kind is surely one of the most convincing arguments that a firm could use, not only to convince prospective customers who are now considering the advisability of installing systems such as those advertised, but also to reach out and secure new prospects, to start them thinking, and eventually secure orders from many of them.

This advertisement, as will be noted in the accompanying miniature reproduction ,was one that was attractively set up and bound to attract attention.

After Rural Customers

The two advertisements reproduced appeared during a farmers' convention which was being held in Regina. This company advertises in about twenty rural papers. The chief idea of the advertisement is to create an interest among the rural residents of the province. This firm selected a certain district or districts and through a process of intensive cultivation they are working the district thoroughly and doing their very best to close up a good volume of business. Their efforts are being concentrated to a great extent and through concentration in various districts they are able to create an interest which would otherwise not develop.

Complete Addresses Given

For instance in the list of satisfied customers six are given at Grand Coulee, six are given at Imperial, and five are mentioned at Simpson, Sask. Individual cases in some centres and two or three cases in other centres are also given in the list, and it will be seen that the list of satisfied customers includes names from many sections, and these names will be recognized by dozens of prospective customers. The illustration in the advertisement adds attractiveness and has a certain amount of pulling power. The advertisement is one which should attract a great deal of attention and in addition to pulling direct business it should start a great many prospects thinking and make them more sus-

A Modern Plumbing and Hot Water Heating System

WITH A SEPTIC TANK SYSTEM OF SEWAGE DISPOSAL

WILL MAKE YOUR RURAL HOME COMPLETE

We will install you a septic tank system of sewage disposal that is absolutely guaranteed.

You need have no doubt about it working.

We are not making an experiment at your expense, as we have them installed and working—not one, but many.

A D & T self-regulating hot water heating system gives you comfort, simplicity, safety and economy.

Enquire from some of our Rural Customers listed below and get their opinion of the systems we have installed for them.

A. Nolan, Rouleau — F. Nolan, Rouleau — G. T. Fewell, Pilman — W. Allan, Grand Coulee — W. Jennings, Fort Qu'Appelle — C. Kyle, Richardson — W. Carman Bradley, Kaddestein — Y. Copeland, Grand Coulee — Government Fish Hatcheries, Fort Qu'Appelle — Fort Hotel, Fort Qu'Appelle — A. A. Downey, Arlington Beach — J. R. Street, Stoney Beach — J. R. Carden, Cupar — F. Dresser, Grand Coulee — P. Ferguson, Cymric — C. Anshelm, Kenaston — J. Hess, Kenaston — J. W. Carmah, Grand Coulee — E. J. Barbour, Imperial — F. Davis, Imperial — W. Weightman, Simpson — R. S. Pengelly, Cupar — H. Ty teens, Kenaston — W. J. Shaw, Imperial — J. F. Forbes, Grand Coulee — R. D. Gallacher, Imperial — O. Otter, Imperial — W. Wilson, Simpson — L. Peacock, Simpson — W. Fielding, Simpson — M. Lees, Simpson — J. G. Potter, Imperial — E. Grant, Pyrus — J. Parsell, Grand Coulee — R. Robinson, Regina — O. Beech, Grey — G. Hummel, Nokomis — W. Mooney, Mawarden — W. Mooney, Stalwart — T. Webster, Estlin

VAGG, WILSON & CO.

SANITARY AND HEATING ENGINEERS

Estimates Given Free—Country Homes a Specialty

Office 1801 Retallack Street, Regina PHONE 3402

Advertisement showing names of 40 satisfied customers.

A SEPTIC TANK System of Sewage Disposal

WITH A

Modern Plumbing and Hot Water Heating System

WILL MAKE YOUR RURAL HOME COMPLETE

We will install you a septic tank system of sewage disposal that is absolutely guaranteed

You need have no doubt about it working

We are not making an experiment at your expense, as we have them installed and working—not one, but many

A D & T self-regulating hot water heating system gives you

Comfort, simplicity, safety and economy

Hand, Gasoline or Electric Water Supply Systems

We have installed some of the above systems. Get a list of our rural customers, and inquire from them of our work given satisfaction.

VAGG, WILSON & CO.

SANITARY AND HEATING ENGINEERS

Estimates Given Free

Country Homes a Specialty

PHONE 3402

Offices 1801 Retallack Street, Regina, Sask.

Simpson Sask. June 28th, 1918

Gentlemen

Having used your Septic Tank since May 1st, 1917, I thought you would like to hear from me regarding the satisfactoriness of the system. Such it certainly is a wonder how it works. We have not had the least trouble with it any way. I don't know the ground was frozen when we started using it on the above date and as the filter beds are only two feet below the ground I am not yet why it did not freeze up but it did not. I must say it is a fine system. There is no smell from it, either inside or out. If you were not told where it was I can assure you could not tell. Far from it with our family and we used them and the Septic Tank for about a year before the others were put in time. It makes the place look just as good as any city home. If you care to use this letter or anyone wishes to inquire, I will be pleased to answer them.

Yours truly,

(Sgd.) W. B. WRIGHTMAN

Imperial, Sask. Feb. 6th, 1919

Dear Sirs

Re the Septic Tank and filter beds which you installed for me in the summer of 1917, I would like to say that it has been most satisfactory in every way. We have never noticed any smell from it, and it has never frozen or choked up, and has never given the least trouble in any way. We have not even had the manholes on the septic tank opened. Every part of the plumbing system has been very satisfactory. It has never given trouble in any way. We would not be without it for twice the cost. I cannot speak too highly of the system, and have no hesitation in recommending it to anyone.

Yours very truly,

(Sgd.) WM. J. GRAW

Testimonial letters are reproduced in the above advertisement.

ceptible to future advertising appeals or personal solicitation.

Actual Letters Reproduced

The second advertisement of the series headed "A septic tank system of sewage disposal with a modern plumbing and hot water heating system will make your rural home complete." goes on to state that "We have installed scores of the above systems. Get a list of our rural customers and inquire from them if our work gives satisfaction."

This advertisement is strengthened by the publication of two actual letters from satisfied customers. The first letter, dated January 26, 1919, is from Simpson, Sask., and reads as follows:

"Gentlemen:—

Having used your septic tank from November 15, 1917, I thought you would like to hear from me regarding the same —a septic tank. It certainly is a wonder how it works. We have not had the least trouble with it in any way, and as you know the ground was frozen when we started using it on the above date two feet below ground, I cannot see why it did not freeze up, but it did not, so I must say it is a fine system. There is not the least smell from it, either inside or out. If you were not told where it was. I am satisfied you could not tell. Far from it with cesspools. I have used them and never want them again. The septic tank for mine every time. It makes the farm house just as good as any city home. If you care to use this letter or anyone wishes to enquire, I wil be pleased to answer them. Yours truly,

W. B. WEIGHTMAN."

The second letter is from Imperial, Sask., dated February 6, 1919.

"Dear Sirs:—

Re the septic tank and filter bed which you installed for me in the summer of 1917, I would like to say that it has been most satisfactory in every way. We have never noticed any smell from it and it has never frozen or choked up, and has never given the least trouble in any way. We have not even had the manholes in the septic tank opened. Every part of the plumbing system has been very satisfactory. It has never given any trouble in any way. We would not be without it for twice the cost. I cannot speak too highly of the system and have no hesitation in recommending it to anyone.

Yours very truly,

WILLIAM J. SHAW"

These two letters from satisfied customers living in sections where this company is trying to do further business with other prospective customers should carry a great deal of weight and be very effective in securing additional business for Wagg, Wilson & & Co.

Part of a Series

The advertisements reproduced here are only part of a series but are reproduced for the purpose of showing our readers the class of advertising which is being carried on by this company. The advertisements are convincing. They drive home the fact that this company has produced satisfactory work for other customers. Actual names and addresses of customers are given.

It is quite common for salesmen or others to say that they have sold dozens or even hundreds of an article, but very often when you try to tie them down to a few actual cases they cannot recall offhand any outstanding cases where prospective customers may go and become convinced for themselves that the article or the work measures up to the claims of the salesman.

In these advertisements names and addresses are given and in two cases even letters themselves are reproduced in order to drive home the information which this company wishes to place before its rural customers and prospects.

Wagg, Wilson & Co. feature in their advertisements that estimates are given free and that country homes are a specialty with their company.

This style of advertising can be adapted to almost any line of goods sold or installed by the trade. The main thing is the idea behind this advertising to drive home to prospective customers the fact that you have satisfied customers to whom you can refer at any time. The company or individual possessing a good list of satisfied customers is certainly passing up an opportunity when neglecting to make use of this information which is of value to the advertiser and of great interest to prospective customers.

There are many ways in which information of this kind may be used including newspaper advertisements, folders, letters, verbally when soliciting business from prospective customers and in other ways.

The main thing is to use the testimonial as a legitimate means of securing new customers, and this is being carried out successfully by a great many firms.

Features of Next Issue

THE unique heating system for the new technical school at Hamilton, Ont., is causing a great deal of talk in trade circles. SANITARY ENGINEER has arranged for a big illustrated article giving all details for the benefit of our readers. This will be one of the best and most interesting articles ever prepared, descriptive of installations in Canadian institutions, and it will appear in the next issue.

There is a real, practical treat in store for our readers in the next issue.

Getting the most out of the territory is a problem with which many of the biggest firms in the country are struggling with at the present time. How can the members of the craft adopt the methods which have pulled business for larger firms? Watch for an article in the next issue.

Scott & Bennett, Galt, Ont., believe in modern display methods and have in their place of business a most attractive display of plumbing, heating and electrical goods. Photographs have been taken for SANITARY ENGINEER and an article on this firm's methods will appear in next issue.

Noble & Rich, London, Ont., when deciding on a location for their display rooms, located on one of the most attractive residential streets of the city, and at the same time on a portion of the street that is easily accessible from the main business section. Photographs of the Noble & Rich display rooms have been taken, and will appear with an article in the next issue.

The third article of the new series on Heating and Ventilating, by N. A. Kearns, will appear in the next issue. Judging by the comments of readers with whom we have discussed the series, this feature is one of the best we have had in a long time.

The foregoing are only a few of the features of the next issue.

We shall appreciate suggestions from our readers at any time. We also ask you to send in any news items of interest to the trade.

Displays That Attract Trade

Peter and Sylvester, Stratford, Ont., Show Sanitary, Heating and Electrical Goods to Splendid Advantage—The Value of Good Displays

Based on a visit by SANITARY ENGINEER representative to Peter & Sylvester show rooms at Stratford, Ont.

THERE is absolutely no question but that a fine display creates trade. It is just as sure to attract trade as the handing out of gold dollars free of charge would attract a crowd. "People sometimes think that I carry the idea of fixtures to an extreme," stated a leading merchant not long ago, but in my opinion they are just as essential in the winning of trade as bread is essential to the making of a meal."

The above expresses to a great degree the sentiments of Peter & Sylvester domestic, sanitary, and heating engineers, Stratford, Ont. For a prospective customer who appreciates beauty and utility in the home, this firm has a display that will serve as an inspiration, and drive home to prospective customers in a most effective manner, the fact that in the plumbing, heating, and electrical trades there are numberless devices handsome in design, practical in character, and of great labor and health saving value.

Before entering the Peter & Sylvester store it is most evident that the proprietors or their assistants are persons of good taste and with ability in window dressing, as their displays were of the kind which arrest the attention of almost any "home person" in these days of advancement in sanitary, electrical, and heating appliances.

The interior is divided really into two stores, though wide openings connect at the front and rear. In the right-hand room on entering is found an elaborate line of lighting fixtures, shown in one of the accompanying cuts. These are in most instances suspended from the ceiling, but tables down the centre of the room carry a wide line of globes and shades and also stand and reading lamps. Here also can be seen an electric grate and mantel, fully installed.

Electric stoves of the better grades are shown here also and these helps to home comfort are increasingly in demand. Vacuum cleaners, electric irons, percolators, toasters and the general line of household appliances are carried and aiso a stock of electric flash-lights, torches and batteries.

In the store at the left of the main entrance will be found a most imposing and well-arranged plumbing display. A wide range of baths, lavatories and closets is shown here and the customer has excellent opportunity of seeing different styles and grades. In this room the attention is called at once to the way in which bathroom fixtures are shown. Large panels covered with black velvet with light oak mouldings as frames, are placed on the walls and serve as a splendid background for the nickel and white fixtures which are fastened on the panels. It would be difficult to think of a more attractive method of showing goods.

Water Systems

In this room also is a residence water system set up ready for action and the advantage of such a display is evident when one is informed of the numerous systems which this firm has sold to residence-owners in the country

View of the display room of Peter and Sylvester, Stratford, Ontario. The accompanying article describes the display methods of this firm. Reproduction on another page shows electrical department in same store.

View in showrooms of Peter and Sylvester at Stratford, Ontario. This shows a section of the electrical department. In the accompanying article a description of the showrooms is given. Another view of the Peter and Sylvester show.

and other localities where the city water service is not available.

A hot-water heating boiler can also be seen here and full examination and explanation can easily be made. A striking feature was an ordinary kitchen boiler set up with electric heating attachment and attached to a basin with hot and cold cocks installed. Here was a salesman's opportunity without doubt, for what householder could fail to be attracted by turning a button and then a tap and having a stream of hot water gush forth?

Lady Assistants in Store

This store is one where ladies would be glad to spend pleasant and profitable hours, and there are lady assistants to assist them in their shopping.

The floors are of hard-wood highly polished and "walks" of a tastefully designed blue and white linoleum are laid down through the stores. The walls are papered in quiet and restful tones and a delightful finish is added by the presence of some very fine potted palms and ferns. Neat cards on walls and different items on show, call attention to "specials" and add greatly to the smart effect. In fact Peter & Sylvester have struck a very high note in the matter of store arrangement.

A very fine large cash register, electrically controlled, stands in the centre of the "electrical" shop, and to the rear of this store is placed the office fitted with modern office furniture, desks, filing and accounting systems, typewriters, cabinets, etc. The workshops are located upstairs, and storage wareroom in a nearby building at the side and rear. The motor car and truck comes into play in this firm also and contributes in every way to efficiency and profit.

To a SANITARY ENGINEER representative, Mr. Peter was very modest when complimented upon the remarkably beautiful and modern establishment which he had so successfully developed. He acknowledged that all of these details of taste, arrangement, extreme cleanliness, brightness and comfort had been carefully thought out and were found to be splendid drawing-cards for more and better business. Incidentally also he gave the information that the firm had just completed a large vacuum heating system in an adjoining town, and had also just finished an installation for the Kindel Bed Co. of Stratford, which included a generator and 27 motors.

Two accompanying illustrations will give the reader of SANITARY ENGINEER, an idea of how the goods are actually displayed in the Peter & Sylvester store. The show windows in the Peter & Sylvester store are also used most effectively.

The writer some little time ago interviewed one of the largest and most successful merchants in Canada. The talk drifted around to the value of displays, and the effectiveness of the display in the Peter & Sylvester show rooms, brings back recollections of some of the merchant's remarks. They are as follows:

"The window is the index of the store. If you want to find something in a book and that book has got very many things in it, the natural way to do is to look in the index. Just in the same way, if a man wants to know if I carry such and such a line of goods, if he dosen't want to go into my store to find out, the next best thing he can do is to watch my windows and see if he can determine it that way. We must get ideas of our merchandise into the minds of our customers. That is what we are there for. If it were not for that, a slot machine could do the work. Salesmanship consists in giving ideas to the customer, to appeal to the senses, not only to the eyes and hearing, but the other senses as well, particularly the sense of the touch.

"Every idea that enters the customer's mind is accompanied by some feeling, good or bad, and you can't help it, it is bound to be there. It is either for or against you. It may be big or little. It may be insignificant, but take one hundred little feelings that are against you and it makes quite a bit of bother. It isn't only the merchandise, but it is the way you sell your merchandise."

Discussions at Ontario Meeting

Thomas J. Minnes, of Brantford, is the New President—Reports of the Year's Work —Toronto Society Banquets the Visitors—Much Important Work to be Taken Up By New Directors—Ontario Society's Annual Meeting

Reported especially for "Sanitary Engineer," by C. E. PARSONS

EDITOR'S NOTE—The accompanying report covers the eighth annual meeting of the Ontario Society of Domestic Sanitary and Heating Engineers, held at Toronto. This report deals with many important matters of special interest to the craft and refers at length to many of the after-the-war problems which we are being called upon to deal with at the present time. Readers will also find the addresses of John F. Irvine, of Detroit, and Kenneth A. McIntyre, Toronto, of special interest. Reports of officers of the Association also contain a wealth of information for the craft. The initiation of 35 new members into Toronto society is also worthy of special mention.

MANY important matters pertaining not only to their own organization and the trade in general but to public health matters were dealt with at the annual meeting of the Ontario Society of Domestic Sanitary and Heating Engineers held in Toronto. A good deal of discussion centred around the new plumbing code for Ontario, which has been prepared and is only awaiting the signature of the authorities to become effective. It was stated that it is being held up because it is alleged the Gas Company brought pressure to bear on the Govehnment.

Will Get Busy Now

It was pointed out that the Toronto members are keeping right after this matter and endeavoring to get it through, but that members who reside in all parts of Ontario could lend very effective assistance by taking the question up with their district representatives in the Legislature and urging prompt action regarding it.

President Frank R. Maxwell, who was in the chair, pointed out that owing to conditions caused by the war, little has been attempted during the past four years beyond keeping the Ontario organization together. Now that business is getting back to its normal channels again he urged that the Society get busy as quickly as possible and endeavor to solve some of the problems of the trade.

The Apprentice Question

Discussing the question of apprentices President Maxwell pointed out that the situation is a serious one. At a recent meeting of the Toronto Society he said figures were obtained and it was found that among forty firms there were only three apprentices.

"You can see what this is going to mean to the trade," he said. "It will bring about much hardship. It will mean many half mechanics. As far as heating is concerned, the trade seems to be so heavy that boys will not work at it any more. Out of the helpers we will have to get the journeymen. In the United States they have helpers' unions. That is what is going to take place in Canada too, at least in the larger cities. We find great difficulty in getting them although the pay is as high as 45 cents an hour for boys to help the men. The young man of 18 is better every time than the helper of 35. There are too many half-baked mechanics. I know of cases where men of this sort out on a job were told only to make a noise, not to do anything as they would spoil too much of the material if they touched it.

Bought a Bond

In presenting the Trustees' Report E. H. Russell, of London, Ont., stated that a Victory Bond had been purchased with a portion of the funds. It was essential to have funds he pointed out, and he hoped that many new branches would be formed and more new blood secured.

The delegates to the Ontario meeting attended a special session of the Toronto Society of Domestic Sanitary and Heating Engineers in the afternoon and witnessed the initiation of thirty-five new members. F. R. Maxwell presided.

During the session John Bruce, of Toronto, official representative of the Plumbers and Steamfitters' Union spoke on "Industrial Democracy." He declared that industrial democracy has been subordinated in the past but is rapidly coming into its own.

"Men have been making sacrifices," he said, "for principles. Are these principles going to be carried out? I have been very pronounced in my views against the injustice workers have suffered during the war. These men are not cattle. They are human beings with rights. Their ambitions for better conditions not only for themselves but for their families is not wrong. It is laudable.

Masters to Blame

The masters are as much to blame as anyone for conditions. They have not made any attempt to meet the men or to get together and discuss things with them reasonably. To-day throughout the world we see a new spirit growing. A few have been amassing great wealth, while many suffered correspondingly by poverty. When the call came from the war, and freedom and democracy were the issues, it found men ready to sacrifice everything. Their participation has cost this world 10,000,000 souls. If clarification is not coming by fire and the sword then this catastrophe has been the greatest the world has known. We must try to raise the standard of democracy. You have a duty. Do not say it is no concern of yours. Solve the problem of bringing about better conditions."

The Whitley Report

Mr. Bruce discussed briefly the Whitley report, and told what was being done in England, where 162 councils have been established and are successfully operat-bringing about better conditions."

"Cut out this cold, calm, competitive system," he said. "The Government is doing little or nothing to combat this unrest that is abroad to-day. It needs men of courage and conviction to correct the evils that are creating that unrest. We can do our share by getting together as an industry and establishing a mutual council at which everything will be taken into consideration and at which we can try to unify business. We must try to create mutual relationships. Employers must get all this new idea. There is nothing greater before us than the study and solution of these problems. No one has any right to put his heel on the neck of those who are down and say 'You must stay there.' You are carrying on an essential work. The first consideration of the nation is the health of its citizens.

THE NEW OFFICERS

President, Thomas J. Minnes, of Brantford, Ont.

Vice-President, Geo. E. R. Grinyer, Guelph, Ont.

Treasurer, T. Maxwell, Toronto.

Secretary, Garret Frankland, Toronto.

Board of Directors—T. J. Minnes, Brantford; G. E. R. Grinyer, Guelph, and Thomas Maxwell, Toronto.

Auditors, Fred Gentle, Toronto; Fred Smith, Guelph; Harry White, Brantford.

Trustees, E. H. Russell, London, Ont.; W. Mahoney, Guelph, Ont.; Garret Frankland, Toronto.

Chairman of the Sanitary Committee, John Wright, Toronto.

Chairman of Heating Committee, Harry Waterman, Toronto.

Chairman of Arbitration Committee, C. Henry, Stratford.

Chairman Apprentice Committee, Geo. Clapperton, Toronto.

Chairman Educational Committee, K. Allison, Toronto.

New Health Department

"The continual hammering of the Labor movement has resulted in the creation at Ottawa of a Health Department. The rules and regulations that are to be put into force are of vital importance. I want to say that the rottenest plumbing system in North America is being put in at Ottawa in buildings which are costing millions."

Mr. Bruce also discussed briefly the Ontario Act in regard to health which is awaiting signature. He urged every member, especially those from out of town, to see the member of Parliament from his riding, and urge that this bill be put into effect.

"It is being held up," he said, "because some boreheaded politicians say that it is not in the interest of the public and can wait."

Guests at Banquet

In the evening the visitors were guests at a banquet tendered them by the Toronto Society of Domestic Sanitary and Heating Engineers. About 150 were in attendance and the affair was voted one of the most successful and enjoyable in the history of the organization. Frank R. Maxwell, past president of the Ontario Society, was in the chair, and following the supper called upon the new president, Thos. J. Minnes, of Brantford. Mr. Minnes spoke briefly, urging the members to co-operate in all the problems of the trade if they wished to solve them quickly and satisfactorily.

Must Work Together

The toast to "Our Profession" was proposed by Louis LeGrow, who pointed out the comparatively small and insignificant results obtained if any one individual tries to work out big problems alone.

"The way to work is through the association," he said. "It is a good thing for men engaged in like occupations to work together in solving their difficulties. That is the way to get results."

The toast was responded to by John F. Irvine, of Detroit, president of the Detroit Association of Domestic Sanitary and Heating Engineers, and also of the Michigan State Association.

How to Make Money

"It is absolutely impossible to make any money in this business," said Mr. Irvine, "without organization. Everyone in Detroit was making money but the plumbers. They were on the road to bankruptcy. We got together and formed an organization. We took in the smaller firms as well as the others, and we let them have just as much say in regard to how things should be handled. We now have over 200 hundred members and we meet every week. At our last meeting 195 members were on hand and those who could not come were represented by written excuses. We handle dilatory members roughly. We do not want them. If they are not interested enough to come out and work with us they are against us and we let them know it. We found out after we were organized that we had some good plumbers and some good steamfitters but that we did not have very many business men. That is one of the faults in the whole business world. Too many start out without an ounce of business knowledge. Someone had told them they could start with nothing and make profits of 20 per cent. and they go to it. They go into business facing overhead expenses of from 45 to 52 per cent. and there is no one there to show them the folly of their ways."

Taught Them Business

"We started out with just those difficulties. We soon found out that we had to make business men. We organized business associations and we got facts and figures. We found out all about overhead and other things and we gradually got things on a business basis. Overhead has got to be paid. The Government allows it and the Government has laughed at some of the biggest merchants and told them they were not charging enough overhead. In Detroit we want the public to know that we are business men. If any man can show us where we are wrong on our figures regarding overhead and the cost of doing business we want to be shown, but so far the only thing we have discovered is that you cannot cut down the amount we figure on for overhead without cutting down efficiency. We have educated our boys to go along and do good work. As a result of our policy in this direction we have practically eliminated troubles of this kind. If a plumber in our organization makes a mistake and it is reported a committee investigates within 48 hours. If the plumber has made a mistake or done bad work he has got to go back and make it right or give the man back his money. If he will not do this he is no longer a member of our organization."

T. J. MINNES

Brantford, Ont., elected President Ontario Society Domestic Sanitary and Heating Engineers.

"We do not want with us men who will not deal fairly. The architects have learned by experience that out association is with them. The public has learned that we do not want to rob them. We meet at any time on call within 24 hours and if there are things to straighten out we get busy and do it. The men not long ago asked for $1 an hour. We took the question up and showed them complete figures and showed them that their request was not justified. They wanted to compromise but there was no compromise, as when we asked them for their figures they did not have them and we had ours which were indisputable. We want to deal absolutely fairly with our men. We want them to have the comforts of life and to own their own homes. We have figured it out and our figures show that out of a man's earnings he needs 25 per cent. for eating, ten per cent. for clothes, ten per cent. for amusements, five per cent for doctor's bills, five per cent. for insurance to protect his family. He should put away fifteen per cent. for savings.

Apprenticeship Question

We have taken up the apprenticeship question. We realize that to make better business men and better mechanics education is needed. We are working between the unions and the mechanics We take the boys that we can train and give them three months in school with their wages and tuition paid. This work is being done for the betterment of the business and the betterment of the community. We do not want floaters or drifters. Our figures show that one man in time of trouble will control ten other men, and if we have the right kind of men we reduce troubles to a minimum.

Get Their Money

Another big problem we tackled was collections. Before we were organized I would not like to tell you how many thousands of dollars were owing to our men. We got busy on the problem. We put in a collection department. We have a first-class attorney and we pay him first-class wages. Just to give you an idea of the size of this work I might say that we have listed over 400,000 accounts. All are graded. If a new customer comes in we call up the secretary and find out what his grade is. In the old days we used to have people riding around in high-priced autos who owed maybe 15 or 20 firms. There was more than enough money owing us in Detroit to carry on all our work for more than five years, but we have stopped that. We are doing business on a business-like basis now and the people respect us for it."

The Business Situation

In touching on the outlook for business Mr. Irvine stated that many places were reporting business quiet in the building line because people had the idea prices were too high or were going to come down.

"My opinion," he said, "is that costs are going to be higher for the simple reason that wages will not be reduced and freight rates will if anything increase, especially if the Government handles them. The whole building situa-

tion centres around wages and freight rates. The building industries take 25 per cent. of the tonnage of the railways. Some of these people who are thinking of building now and putting it off waiting for prices to come down will wake up in about four or five months to find out that costs have advanced."

Urges Co-operation

John Bruce spoke briefly, discussing the labor situation. He said that labor was asking for better living conditions for all its members.

"It is absolutely inconsistent," he said, "to put things right over in Europe if we are not going to put things right at home too. We have a good deal in common. We must get closer together and work together. If you fight as individuals you will get nowhere. The world was made for you and for no one else. Grow and grow for good."

Gave Him a Cane

A very pleasant feature of the evening came next when Secretary Garrett Frankland was called upon by Past President F. R. Maxwell to make the presenttion of a handsome silver-mounted cane to J. F. Irvine. Mr. Frankland, in making the presentation, spoke of the work Mr. Irvine has done for the trade in general and of his visist to Detroit and the many valuable pointers he obtained. Mr. Irvine, although completely taken by surprise, thanked the members for their gift.

The New Members

The toast to "Our New Members." was responded to by W. Mahoney, of Gueph, who spoke of the pleasure it gave all to see the Toronto organization in such a flourishing condition. The taking of 35 members, he said, was an event of which any organization might be proud. He referred reminiscently to a meeting some years ago of the Ontario organization, at which only five delegates showed up.

The toast to allied organizations was proposed by George Waterman and responded to by Messrs. Dillon and Finnemore.

A recitation, "Democracy as Seen by a Soldier," by George Baker, was heartily encored.

"The Open Price Plan" was the subject of an address by Kenneth A. McIntyre, of the firm of Beattie & McIntyre, Toronto. By way of introduction, Mr. McIntyre, who is chairman of the Ontario Association of Electrical Contractors and Dealers, explained that the organization forms part of the Canadian division, in affiliation with the National Association in the U.S. The electrical industry is being organized along international lines and the movement, originated in California by W. L. Goodwin, is to include manufactures, jobbers and central stations; also that trade conditions and problems in the electrical industry very closely parallel those in the plumbing and heating business.

Business Ignorance

The product of the electrical or the plumbing and heating contractor is a finished installation. Many of the circumstances and conditions are beyond the control of the contractor, yet he must set a price on his work. If he be a successful contractor, using proper methods of cost accounting, he will be able to determine a price based upon cost plus overhead plus a reasonable profit. More often than not, this price is not the market price of his finished product. The market price may be that set by an ambitious competitor operating with total disregard for such important items as costs and overhead.

Past Measures

This condition first gave rise to the "price-fixing" idea, a practice not only illegal but unfair and ineffective. The result is to protect by artificially sustained prices the inefficient contractor. Proceedings cannot bear the light of day and the public becomes rightly suspicious,

GARRETT FRANKLAND
Secretary Ontario Society Domestic Sanitary and Heating Engineers.

bringing the trade into disrepute. Within the trade itself it creates a bad atmosphere.

Some years ago in the steel industry this scheme was tried with the usual result. Representatives of the different firms would get together and agree to charge certain prices for their products. After the meeting it would be almost like a race to see who could get to the customers first so as to cut under the prices agreed upon. Finally one man becoming disgusted announced that he would have no more to do with the scheme. He would not promise to maintain any prices but he would send to each of his competitors periodically a list of the prices he had already quoted. This was the "Open Price Plan" in its first form.

"The Open Price Plan"

This plan was originated by Mr. Arthur Jerome Eddy, of Chicago, a prominent attorney. It has been successful in many lines of business, and has just been recently adopted by the Toronto District of the Ontario Association of Electrical Contractors and Dealers.

A brief description of the procedure adopted for Toronto should make the plan clear to the reader.

1. The open price plan is open to every member of the Association, and each member is supplied with printed forms for reporting tenders.

2. Each member reports to the secretary an exact copy of tender together with summary of estimate. This report is sent at the same time and by the same means by which original tender is sent, (that is by mail, telegraph, telephone, messenger, etc.)

3. Upon receipt of this information the secretary exchanges same with all others who have reported tenders on the same job.

4. The successful contractor reports to secretary immediately upon closing job that same has been closed, and the price.

5. Notice of award is then mailed by the secretary to all members who have tendered on the job.

6. Meetings are held in addition to the regular business meetings, for the express purpose of discussing all the information obtained and the subjects of estimating and cost accounting. Minutes of these meetings may possibly be exchanged for those of similar meetings in New York and Chicago.

Not to Fix Prices

The object of the open price plan is not to fix prices, but to stabilize prices by publicity, much in the same fashion as transactions in stocks and bonds are listed on the stock exchange. Prices are made known only after they have been quoted. It is the intention later to have members report monthly cash receipts, average weekly pay roll, etc.

The results of the open price plan are to give members confidence in one another, to make business more efficient and to give increased business with less cost for estimating.

There must be a square deal all around, not only for the members but for the public. Publicity is desirable because understanding of the plan makes for confidence. Furthermore, the member who is given to unethical practices is driven into the open and either reformed or ostracized.

In New York City the members figure they saved $200,000 in the first year's operation of the plan, and the average number of tenders per job was reduced from about 15 to 4 or 5.

In conclusion Mr. McIntyre, referring to Mr. Irvine's talk, stated that the Toronto District Association in conjunction with the Toronto Local of the Electrical Workers, have provided for compulsory technical education of apprentices during the training period of four years. This technical course will begin in the coming Fall.

Following are the reports which were presented and adopted:

PRESIDENT AND DIRECTORS' REPORT

Fellow Officers and Members,—We are gathered together to-day to officiate on behalf of our Craft in the affairs of the Ontario Society of Domestic Sanitary and Heating Engineers Eighth Annual Meeting, and all of us must realize the immense field of opportunity that lies ahead for those who are to continue the work of this Society. if we as a craft are to secure the desirable conditions that are our just due.

Since last we met the conflict of right over might that had waged for over four years was brought to a finish, as far as the field of battle was concerned, and now rests in the hands of our Statesmen for a conclusion that must for all time assure the world at large freedom from oppression.

Many Afflicted

Many of us have lost dear ones, and in passing I must make mention of one of our own, who was one of the first to make the supreme sacrifice in behalf of all of us, one of whom I can speak personally, he having been an apprentice under me and for whom I performed the painful duty of severing one of his fingers, at a time when he had met with an accident, through cutting with a cold chisel his finger practically off. I refer to Captain Tom Lockhart, of Galt. We also have had several of our members returned, suffering from casualties of one kind and another. Walter C. Millar, of Fort William, who I am given to understand will never be able to work at our business again.

Now Game Warden

Another old guard in Edward Higginbottom, of Fort William, who assumed to do his bit over there, and is now game warden for his district, a position which Ed. can ably fill, I feel sure you will agree. Frederick Fainsbury, of Weston, is again with us after three years over yonder, and also Messrs. Kirtley, Griffith and Allan Forbes Keith, of the Toronto Committee, while Messrs. Harry Ruddick. who has been awarded the D.C.M., and Albert Crowne, are still to return. This will but go to show that we were represented in the big affair, and I feel sure, the record of our members will stand second to none for valor and effort while in the ranks of the soldiers of the Allied Armies. Another war that raged with great violence throughout this country and many others, was the epidemic of influenza that struck us most frightfully during the late fall, and while I surmise very few of us missed it entirely, I regret to record the death of one of our very esteemed young members in the person of R. A. Sell, of Waterloo, who was very suddenly taken off in October, 1918.

Carried On

Generally speaking I or your directors have no great programme of accomplishments to set before you for the past year because, as I stated last year, we would continue in office, and economically carry on until the war discontinued. Gentlemen, this time has arrived, and we have come to the point where organization in its most aggressive mode must be resorted to, so that we may place our Society in a position of authority for our craft in Ontario.

To do this requires capital, energy on the part of members as well as your officers, and confidence in the rights of our Society and its members in the mind of the public. Remember, cash co-operation and confidence.

Many Opportunities

Many, indeed, are the avenues open for improvement of the methods of operation carried out by the members of our craft in conducting their business, and no doubt some drastic change must take place before we shall ever secure ideal conditions of competition among our fraternity. But, I am prone to believe that whether we will or no, conditions will be changed for us in the near future.

The Labor Department of Canada have seen fit to inaugurate council, for conference between employer and employee, in numerous lines, and for one in which we are interested, there is the Building Trades Council, comprising representatives from the Toronto Builders' Exchange, the Master Painters, the Electrical Contractors and ourselves, together with those representing the labor organizations of the building trades.

Conference Board on Social Conditions

Another feature that is a step in advance of any past methods, is a plan called the Open Tender System, whereby all competing contractors submit copies of their tenders to their competitors. This will be fully explained to the members at our Convention by an authority on the method.

Our Workmen's Compensation is fortunately for all of us remaining at the 80 per cent. cut-rate for 1919, and several

KENNETH A. McINTYRE

of Beattie and McIntyre, Toronto. Mr. McIntyre delivered an address on the open price plan.

amendments, which allow a larger protection to the worker, will no doubt be added at the present sitting of the Legislature. Our Provincial Plumbing Regulations are in a state of status quo, and will most likely be ratified at any time now. Mr. John Wright, of Toronto, who has energetically taken this matter up, will no doubt have something of interest to us all to report at this meeting.

During the past year there has been formed a new Association covering the Dominion, in the interests of the Building Trades. This body styles itself The Canadian Association of Building and Construction Industries, and comprises everyone who is interested in the manufacture, distribution and installation of building and construction materials, being divided into three groups: the manufacturer, the general contractor and the trade contractor, like ourselves.

The first general conference was held in Ottawa on November 26, 27, 28, of 1918, and our Secretary attended as our representative, while Messrs. Blyth and McKinley, of Ottawa, also were present in the interests of our craft. Considerable progress was made at this conference, and to save going into same at length I will just note that anyone wishing to secure a copy of the proceedings of that meeting can do so by notifying the secretary of their desires. Again on March 3rd and 4th the National Council of this Board met in Toronto to appoint a Secretary and ratify other matters that came out of the general conference held in November last. Myself and Secretary Frankland attended these Council Meetings, as did also Messrs. Clapperton and Mansell, of Toronto, and Mr. James Ballantyne, of Montreal. I have been appointed a member of the National Council as representing our craft, and do believe that in the near future much good will result to us from the endeavors of this new body. Returning to our own organization I must make mention of the activities of the Canadian Society which this year will meet in Montreal on June 3rd and 4th. Headway has already been made in the West, the Province of Saskatchewan having held a very successful meeting last month in Regina, and signified their intentions of being present at the coming National Convention. We in Ontario must be up and doing, if we are to retain our premier position in the Canadian body, and every member should make it a point to be in Montreal on June 3rd and 4th of this coming summer.

In closing your directors can only once again mention the necessity of organization for our craft in Ontario, first of a local nature, and secondly provincial, so that the desired benefits that should be ours may be forthcoming through our combined efforts. It is for this meeting to decide on our future policy in this regard, and we say unhesitatingly, all hands be up and doing, or we as a body will have to stand back and see our rights encroached upon from all sides and by all other interests.

We thank the members for the honor placed on us for the past several years, and trust that our policy of retrenchment, which shows in the very handsome start made in purchasing a Victory Bond for five hundred dollars, will meet with your approval, and be the nucleus of a greatly increased invested capital in the interests of our society.

Thanking you again, we are

Yours respectfully,

The Directors.
J. R. Maxwell, pres.
Fred. H. Gentle, vice-pres.
Thomas M. Maxwell, treas.

Following is the report of Mr. John Wright, Toronto, on the Provincial Plumbing Regulations.

Mr. President and Gentlemen, — As Chairman of the Sanitary Legislation Committee of your Toronto Committee, and being in direct touch with the Provincial authorities, regarding the enactment of our proposed plumbing regulations for the province, in amendment of Schedule B of the Public Health Act, I beg to report the following progress in the matter to date.

For your information I include the following extract from the Report of the Provincial Sanitary Engineer, Mr. F. A. Dallyn, B.A.Sc., C.E. (Toronto), to the Chairman and members of the Provincial Board of Health, Ontario, under date of July 8th, 1918, and included in the Thirty-sixth Annual Report of that body.

Annual Report

Mr. Dallyn says in part: Gentlemen, I have the honor to transmit herewith my annual report for the year 1917.

The extension of water and sewerage works amounted to the sum of $2,880,534.72, including waterworks systems and extensions, as well as sewerage systems and extensions, as well as water purification and sewerage disposal.

The plumbing by-law has been further revised and brought to what appears to be a satisfactory conclusion. The subject is dealt with in some forty-five pages and the material sub-divided into 250 sections. It

deals with sanitation in rural sections without sewers, local organization in urban communities, plumbing inspection, details of and minimum requirements for the installation of plumbing, not only in urban centres, but in the province and rural communities generally, and with the standardization of the weight of fittings, drainage pipe, etc., required for and generally used in this class of work. The amount of labor involved in the regulations respecting sanitation (plumbing, etc.) has been considerable, but it is felt that the advantages will more than counterbalance our effort in the matter. The advantages to be derived from the regulations are that with the general improvement of property evidenced, not only in urban communities, but in rural communities as well, the work of installing sanitary conveniences, of the water carriage type, will be carried on in a sane and proper manner and that this expansion will not be subject to exploitation. Plumbers, after the passing of the regulations, will not be able to obtain business in competition through the use of inferior materials and inferior workmanship, either of which are exceedingly expensive in the end and subject the owners to considerable risk for nuisance.

Under Consideration

I also include the following insert, as taken from a letter I received from the Provincial Secretary. The question of the adoption of certain regulations in connection with the instalment of sanitary conveniences, plumbing, water service connections, house connections to sewers, etc., and gas fitting, is receiving careful consideration, and it is hoped it may be found possible to get these in a form satisfactory to all concerned.

The above will show you, gentlemen, the situation the regulations stand in at present, they having been passed by the Provincial Health Board, and the Cabinet, and now only await the signature of the Provincial Secretary to make them operative.

I strongly recommend that the members interview their local representatives in the Provincial House, and secure their assistance in bringing to the notice of the Government, the necessity of the early enactment of the Amendment of Schedule B of the Public Health Act. Also to refrain from having any local plumbing by-laws adopted, until the provincial regulations are enforced. Thanking you, I am, yours respectfully, John Wright.

THE REPORT OF THE EDUCATIONAL COMMITTEE FOLLOWS

Gentlemen.—During the period of the war your Educational Committee have been attempted or accomplished along the lines of eduction of the craft.

Now that a permanent peace is at least in sight, however, the writer feels that opportunities are presenting themselves, which will never be available in just the same way again, and urges the prosecution of a vigorous campaign along lines arranged by a program committee, a bare outline of which is hereby submitted.

Demand Attention

Some of the numbers affect the manufacturers, some the contractors, but all of them affect all of us and, hence, demand attention if we are to place the business on a more substantial footing. Here are a few suggestions:—

(1) A bumper convention.
(2) Re-arrangement of fees on a sliding scale; to include manufacturers, jobbers and contractors.
(3) The adoption of a standard set of books.
(4) Adopt better cash discounts.
(5) Standard apprentices' working rules.
(6) Standard specifications.
(7) Pipe manufacturers to adopt standard resale price for pipe.
(8) A central office.
(9) The restriction of the plumbing trade to its legitimate channels from manufacturer to jobber to consumer.
(10) A standard resale price list on all plumbing goods and a standard guarantee.
(11) A forceful advertising campaign.
(12) The open price system.

Just at this point may I offer a few suggestions taken from a letter of R. L. Tansel, sales manager for the Vaile-Kimes Co., Dayton, Ohio.

Should be Stopped

The practice of selling goods to a consumer is wrong and should be stopped. The public will have to learn sooner or later that the place to buy plumbing material is from a sanitary engineer; that a sanitary engineer's judgment is worth something; and that he cannot accept responsibility for goods that he does not sell himself. When people wake up to the fact and realize that a sanitary engineer's advice is just as important as a doctor's advice on medicine or a lawyer's advice on law, then, and not until then, will things be satisfactory.

A Common Practice

A common practice, which, no doubt, you are all familiar with, some fellow is out

JOHN F. IRVINE

President Detroit Association of Domestic Sanitary and Heating Engineers who addressed Ontario Society. His address is incorporated in accompanying report.

of a job, does not know anything at all about sanitary engineering—he may be a good blacksmith or salesman—the sanitary business looks like easy money to him and without much trouble he gets the agency for a line of goods you handle. Of course, if price is the only consideration, you cannot expect to compete with such competition as this. You lose the job. The Jack-of-all-trades installs it. This, of course, causes trouble and it is brought about by manufacturers who are willing to sell their products to any Tom, Dick or Harry who wants to buy them.

May Sell Direct

Then, again, suppose you have an agency for a certain line and have made a number of sales. Maybe they have given good satisfaction, due entirely to your skill in making the installation. You are making a reputation not only for yourself, but also for the manufacturer. A few months afterwards that manufacturer sends a salesman into your territory and sells direct or he sells to some blacksmith shop or junk-dealer up the alley. Again, you meet unfair competition. The other fellow gets the benefit of the advertising that is the result of your good workmanship on jobs that you have installed.

Should be Endorsed

The supply house who sells only to legitimate plumbers, leaving out entirely the Jack-of-all-trades, should be endorsed by this organization, and not in any small way either.

There is a solution as to how we can deal with the matter to prevent manufacturers selling direct to big mail order houses, if we can find it. Our friends across the border, who are wide awake to the facts that their interest must be looked after, are moving in the right direction and meetings have been held—educational campaigns have been decided upon—and they are asking that this be carried on vigorously and extended to other States. Such a campaign will make sanitary engineers better merchants, raise their prestige and increase their profits.

Urges Co-operation

The purpose of this program is to amicably discuss problems and evils confronting the sanitary engineers and to secure the co-operation of jobbers and principal manufacturers in solving them to the best advantage of the trade. These conferences are in reality the preliminary to a number of others of like character that are to follow, with the expectation of developing remedial and promotional measures in a definite concrete way. District meetings are being held in various sections in the States so that the many unable to leave their place of business to go to headquarters will be kept fully informed and their ideas secured. The dominant note of these meetings was "co-operation" between legitimate sanitary engineers, jobbers and manufacturers. It is told that there was case after case described in support of the contention that there was a lack of triple co-operation, this being harmful to the interest of all.

Must Use Discretion

Expression from the trade made it clear that the manufacturers and jobbers should exercise more discretion in placing goods and extending credit, as to the ability and responsibility of men, to be given recognition as dealers. Instances were cited where credit had been given too freely to inexperienced or irresponsible men breaking into the plumbing business and who ultimately failed. The extremely low bids they made on jobs not even covering cost or expectancy of paying for material they obtained on credit, it was suggested that steps be taken to eliminate these evils. This was agreed upon and plans are now under way to definitely pursue and work out. It was freely admitted that, generally speaking, the sanitary engineers have neglected to develop their merchandising possibilities with the result that outsiders are attracted by the prospect of sales profit.

Seek Information

Manufacturers who are "right" with the trade will be asked to give their co-operation to these meetings by sending representatives who are competent to give helpful information as to business-building methods, the result of sales campaigns of various kinds, the proper use of advertising space and material, etc. In fact, everything that has been advocated by our American friends could, with benefit, be followed by this Society.

In conclusion, let me say that while no hard and fast rule can be laid down for any course of action by the executive of a committee without a great deal of consideration, it is the earnest desire of the writer to see at least some of the points as outlined carried out, believing that in doing so we will not only profit individually, but will have rendered a distinct service to the trade in general that will leave the mark of "progress" stamped indelibly on the past performances of the Association of Domestic Sanitary Engineers.

(Continued on page 38)

Doubles Business in Five Years

Progress Made in the Retail Plumbing and Heating Department of the J. H. Ashdown Co., Winnipeg—Farmers Investing in Modern Equipment

Written for "Sanitary Engineer" by H. L. SOUTHALL

Editor's Note.—The accompanying article on the business of the retail plumbing department of the J. H. Ashdown Co., Winnipeg, throws some interesting sidelights on the possibilities which exist for the sale of modern equipment in both city and country. There are some members of the craft who are critical of firms doing a business in these lines without also making the installations. No attempt is made in this article, nor is it the intention in this article to condemn or justify the practice, but rather to place before our readers the facts as they exist, and the manner in which this company has within a few years practically doubled its business on the lines in which we are interested.

DURING the past seven years the business of the retail plumbing and heating department of the J. H. Ashdown Hardware Company, of Winnipeg, Man., has nearly doubled.

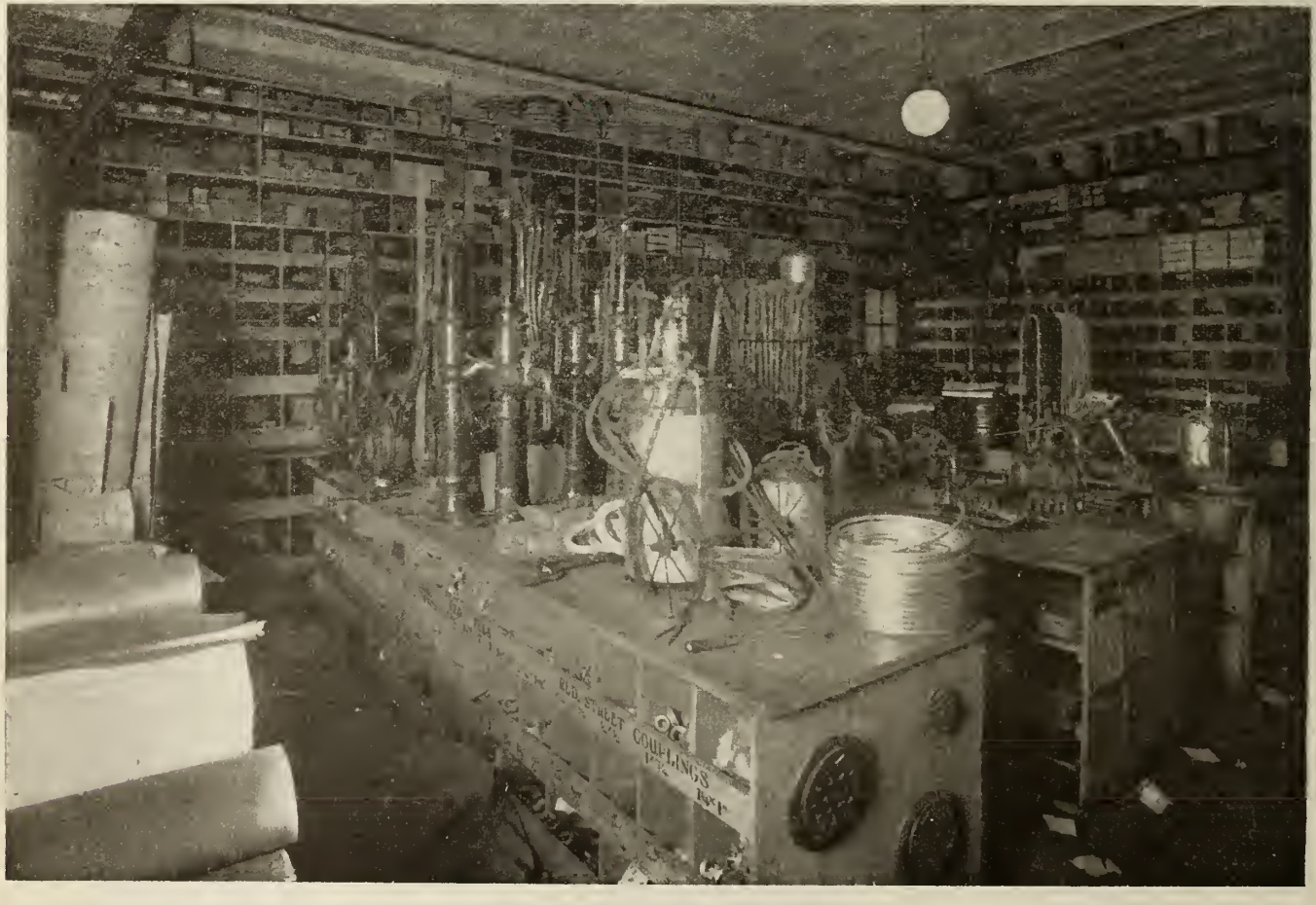
Originally the wholesale and retail business was conducted in the same section of the store, at which time, Sam Tait, well known in the trade of the West, was manager of the department. Seven years ago the two sections of the department were separated; and for the past five years the retail department has been under the management of Wm. Shannon.

The plumbing and heating department now occupies approximately 1,000 sq. ft. of floor space, with adequate cabinets and display cases, etc. This is in marked comparison with the situation when the wholesale and blacksmith departments sandwiched the retail department between them in the equivalent of the space now occupied by the retail business alone. Of course, considerable space on upper floors was devoted to the wholesale end of the business at that time in addition to the limited space on the ground floor.

The enlargement of the retail department has been very necessary to keep pace with the greater volume of business being done, which now averages in this department alone about $100,000 yearly turnover.

Three outstanding phases of the plumbing and heating business are emphasized by the retail department of the J. H. Ashdown store. These three include farm business, factory and mill supplies and plumbing repairs.

The average Western farmer has had larger monetary returns from his crops in recent years than formerly and has shown more enthusiasm in the modernizing of his home. The advent of the automobile, tractor and other up-to-date equipment on the farm has helped the farmer to a better understanding of the necessity for installing modern equipment throughout. Many of them indeed have been sufficiently sane to spend the equivalent of the price of a pleasure vehicle on home equipment and wait till



Section of the plumbing goods department of the J. H. Ashdown Co., Winnipeg, Man. The accompanying article gives details regarding business of the department.

next year to buy the automobile or tractor.

Farmers in the Market

For this reason a larger number of farmers are in the market for rural plumbing, heating plants, water systems, and electric light plants.

This business is sought by the J. H. Ashdown store by means of advertisements placed in the newspapers of rural districts within a radius of approximately one hundred miles of Winnipeg. Best results have been achieved by concentrating on a district of this extent rather than attempting to cover the whole prairie district.

Mention is made in the newspaper announcements of a catalogue giving full details of the water and electric light systems and pumps, and this plan has been largely relied upon for the development of business.

Prices are Quoted

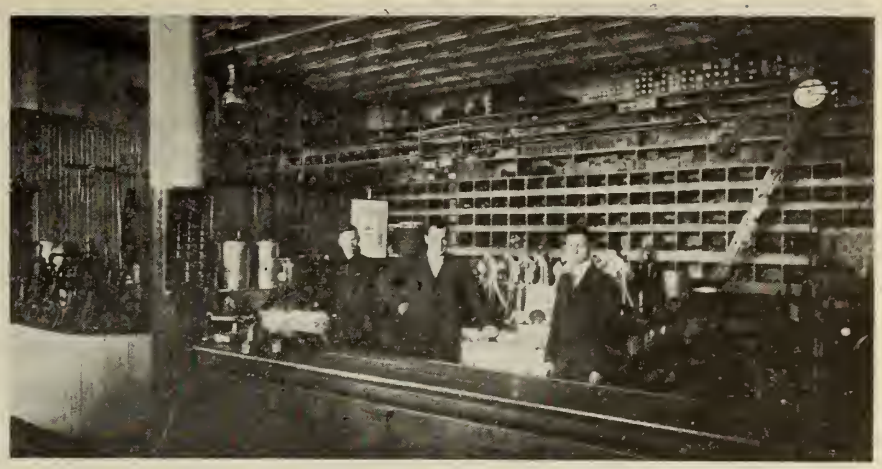
Figures have been compiled showing the cost of various complete household systems, so that the farmer can readily comprehend what he will have to pay for the equipment. The average cost of a plumbing and heating system is from $1,000 to $1,200. This figure does not include cost of an engine for pumping as it has generally been found that many farmers already have this equipment. This figure is cheaper than similar equipment would cost in a city home as the farmer is not called upon to comply with certain city by-laws in regard to plumbing which increase costs.

Furthermore, this cost does not include installation as the Ashdown Company does not employ plumbers and steamfitters for this purpose. It is stated in the company's literature that the systems are not complicated and that a man with average skill can instal them. Generally the farmer purchasing such a system hires a man from the city or nearby town for the purpose of installation.

A specialty is made of one type of gas engine ranging from 1½ h.p. to 9 h.p. It has been found by this company that an engine of this type and power is best suited to farm requirements for chopping, pumping, and electric light systems. Obviously the most popular engine with the farmer is the one which gives least mechanical trouble under the heavy strain of constant running.

Factory and mill supplies constitute another important phase of the Ashdown business in the retail plumbing and heating department. A specialty is made of such lines as valves, packing, piping, hose, and other fittings, etc., for this class of trade. To secure this business a man is engaged to constantly visit local factories, hospitals and other large institutions. For this trade the Ashdown store holds an exclusive agency for a line of valves, pumps, etc.

Plumbing repairs is another active department in this business, and Ashdown's have an extensive line of such repairs. A specialty has been made of repair parts, with the result that at the present time there are over two hundred different repairs catalogued and listed in cabinets. A special cabinet containing 32 drawers, each divided into numerous small sections is now being constructed in order to cope with the constantly-increasing number of repairs which it is necessary to have in stock for the many new lines of plumbing goods coming on the market from time to time. These repairs are for bibs, plush tanks, etc., and a very complete line is carried.



View in Ashdown Department in 1914.

WM. SHANNON
Manager Plumbing Department of J. H. Ashdown Co., Winnipeg, Man.

Some idea of how the plumbing and heating department of this store has grown in the past few years may be had in comparing the present extent of the department occupying 1,000 square feet of floor space with the department as shown in the illustrations accompanying this article.

FIRES ARE PREVENTABLE

The Ontario Fire Prevention League, in affiliation with the Ontario Fire Marshal's office, has issued an interesting bulletin entitled "Fire Prevention on the Farm and Elsewhere."

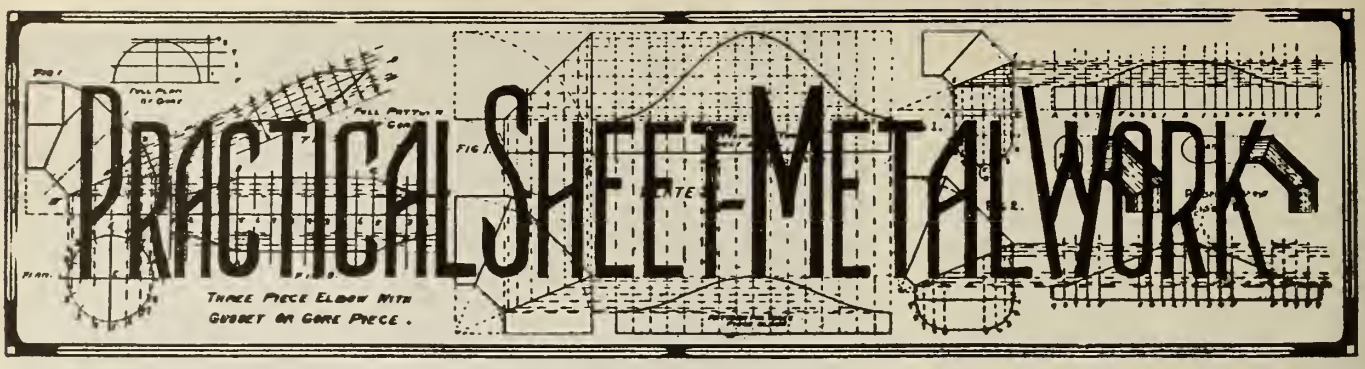
The bulletin deals in a concise way with common causes of fires on the farm and elsewhere, and points out that a tremendous proportion of the fires in Ontario are due to carelessness in taking proper precautions. The fire waste in Ontario, according to the bulletin, exceeds $40,000 per day, which means a tax of $6 per capita on the population of the province. The bulletin recommends a reversion to the Mosaic Law, which is still in force in many European countries, which says that to have a fire is a crime.

AT THE LYONS FAIR

Among the exhibitors with their representatives in the Canadian section at the Lyons Fair in France, are London Concrete Machinery Co., London, Ont., John C. Doidge; Pedlar People Limited, Oshawa, Ont., W. E. Clarke; Beatty Bros., Ltd., Fergus, Ont., M. J. Beatty and Flt.-Lt. R. B. Stewart; Pacific White Lead Co., Ltd.; Canada Foundry and Forgings, Ltd.; Standard Chemical Iron and Lumber Co., Ltd.; Pratt & Whitney Co., of Canada, Ltd., Asbestos Manufahturing Co., Ltd.; Welland Vale Manufacturing Co., Ltd.; Metallic Roofing Co., Ltd.; Bishopric Wall Board Co., Ltd.; David Maxwell & Sons, St. Marys; Richards-Wilcox Canadian Company; McClary Manufacturing Co.; A. N. Smith; Taylor Forbes Co., Ltd.; C. Martinier; T. S. Simms & Co., Ltd.; L. W. Simms; Brandram Henderson, Ltd.; Chas. H. Gratton.

COAL RESOURCES OF BRITISH COLUMBIA

The Crows Nest coal field is the most important body of coal that is being mined in British Columbia. It includes an area of 230 square miles. The coal is a high grade bituminous, occasionally running into anthracite, averaging about 64 per cent. fixed carbon. Much the greater portion of the coal is converted into coke, the remainder being sold as steam coal. There are 22 workable seams, with a total thickness of 216 feet, 100 feet of which is estimated as workable.



BY THOMAS STANSFIELD

ONE of the main features in the management of a tinshop is to be able to use the patterns for more than one article when there is a similarity. Take a 90-degree elbow pattern of, say, 6 inches diameter, or any diameter, for that matter. Suppose a pattern for a roof flange is required for a pipe 6 inches diameter or any diameter, and the slope of a roof is 90 degrees, all that is required would be to cut out a piece the shape of the pattern, make it up into a pipe, and stand the mitre end on the flat sheet of metal from which the flange is to be made. Mark round the pipe at the mitre, and the pattern for the hole in the flange is procured. The same with the flange piece to fit on the ridging. If the pitch of the roof is, say, 90 degrees, the same method can be followed, and by simply bending the flange at the middle, the piece is ready to fit to the roof.

This does not apply to 90-degree sloped roofs only, but to any slope. The various elbow patterns can be used in this same way, and much time can be saved. While it is not the technical method, "the kink will do the trick," and is a time-saver.

Fig. 1 shows the perspective view of a pipe extending through a roof with plan, elevation, and pattern. The proper way to develop the pattern is by first drawing the plan and elevation. The sloped line in elevation represents a 90-degree pitched roof. A B C D is the pipe extending through roof.

Divide the half plan into equal parts, with X5 as centre. Now draw a number of vertical lines from 1, 2, 3, 4, etc., to line E F, which represents not only the slant of the roof, but also one side of the pattern for flange. From the various points on line F E draw dotted lines parallel to lines F G and E H, and divide the flange by drawing line J K through the centre, and number this line with the corresponding figures on plan.

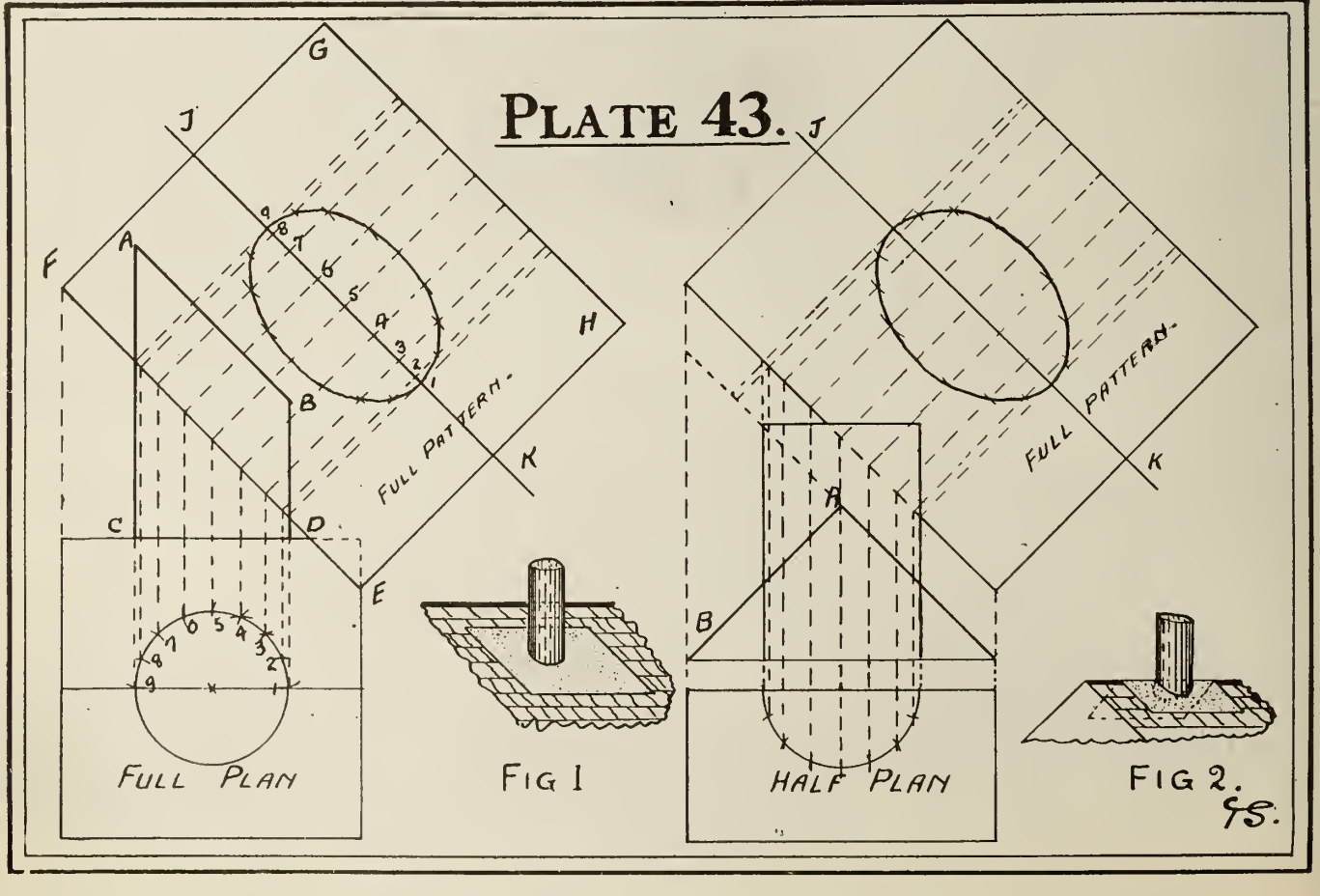
Next place the point of the compass on line drawn through the plan and open to 2, transferring this measurement to the line K J, cutting dotted line 2, and transfer all the measurements from plan in the same manner until all the dotted lines have been intersected.

By connecting these points as shown by solid line, the pattern of the hole for flange is procured.

The same method is adopted whatever the slope of the roof may be.

Fig. 2 shows the perspective view of

(Continued on page 46)



What About the Slow Pays

Persuasiveness and Punch in the Collection Methods Pulls in the Coin—Letters That Brought Results

THERE are few members of the trade who have not at some time or other been more or less worried over the way in which book debts have piled up, with consequent annoyance and embarrassment to the dealer, but not to the debtor.

Some merchants have lost faith in the efficacy of the collection letter. They question its ability to return with the goods, yet an Eastern Ontarid firm by putting a little different tone to the etters have found them the means of assuring a collection in a multitude of unexpected cases.

Debtors can be placed in several classes, but "slow and sure," "forgetful," "hard to part" and "don't want to pay" are the best known ones.

The old stickers with their cut and dried phrases and smart sayings have come to be looked upon as almost a friend by the class of debtor who gets them so regularly from different merchants. Were they to cease to put in an appearance they wuold be missed and leave an aching void in the regular round of expected events.

Then you come to the usual letters asking for payment. It will be noticed that the majority of these in cold, formal, matter-of-fact language pass without results.

A little human interest pushed into service would work wonders and draw the cash.

An Eastern Ontario firm had endeavored in every way to collect by ordinary letters, stickers, lawyers and also by special collectors.

The letters brought few returns, the stickers were useless, the lawyers were as hard to get the money from as the people from whom they had collected it, while the special collectors frequently brought home less than their day's wages amounted to.

Then came the letters with the human touch. There are five of these little fellows, each with a distinct work to do and they won out, making nearly 30 per cent. cash payments as well as a large number of settlements, either with notes or written promises to pay.

The best part of the success was the fact that a number of accounts that were five, six, eight or even ten years old and therefore outlawed, came in as a surprise packet to everybody.

These letters were printed in imitation type to match the machines used in the office. Names and addresses were added and each letter signed by the head of the firm. Including paper and printing, the letters cost a little over one cent apiece. Five hundred sent out brought in over $2,500 in hard cash within seventy days of posting the first letter, in addition to which many other settlements were arranged.

No ill feeling was caused and in several instances customers bought more goods immediately the old accounts had been adjusted.

Letter No. 1 was sent to people with recent accounts and was very successful in getting cash which would have laid out for some months. Letter No. 2 was sent to customers with older accounts and was followed by No. 3. No. 4 aroused those with a slumbering conscience. Letter No. 5 was rarely necessary but when sent gave good results. Cash was received in less than 48 hours in some cases.

Here are the letters. Nothing smart, nothing fancy, but they worked:

LETTER NO. 1

The statement of your account enclosed with this letter shows the same to be of recent date.

Present day conditions of business compel us to alter older methods, and we find it is impossible to give the extended credits which were possible in the past.

You will quite understand our position in this matter and we believe you will accept the letter in the spirit intended.

Your remittance will be sincerely appreciated and at the same time we solicit your continued patronage which we assure you will receive our best attention.

LETTER NO. 2

The enclosed statement of your account shows the same to be long-standing.

We feel sure you would be glad to have the matter settled and off your mind, but you cannot be more anxious than we are. Cash is badly needed. Will you help us by remitting at once.

Yours Respy.,

LETTER NO. 3

We wrote you a short time ago to draw your attention to our account long overdue.

Has the statement been laid aside and overlooked? In case this is so, we enclose another one which we very sincerely hope will be returned with your remittance by return mail.

Yours Respy.,

LETTER NO. 4

Your statement of account enclosed with this letter is much overdue. When the courtesy of credit was extended to you, it was because we believed in your willingness and ability to meet your obligations. We hope you will endeavor to prove our expectations were correct by remitting quickly, a favor we shall very much appreciate.

Yours Respy.,

LETTER NO. 5

We regret our previous letters in regard to the statement enclosed, have remained unattended to. Your failure to remit has placed us in an unpleasant position. Unless this account is paid it must be collected and cost of collection added to it which is unnecessary. Kindly attend to this matter within 10 days from this date so that we can keep the account in our hands instead of passing it over to our agency.

Yours Respectfully,

LETTER NO. 6

And in the event that all these letters failed of their purpose there is still this possible sixth letter. It does not appear in the series noted herewith. It is added by this paper out of pure good heartedness.

What does it say? Supply the words yourselves. You have all had experience with these customers who are deaf to the blandishments of the most persuasive letter: frame then the opinion of these folks and write it here.

EDITORIAL COMMENT

A SAFE MARGIN

EVERY business man to-day is paying a great deal of attention to his buying. But of almost equal importance is the matter of selling. The merchant who has not already done so, should immediately analyze his business affairs and ascertain whether or not he is securing a safe margin of profit.

HONESTY PAYS

BUSINESS reputation is built by years of patient endeavor. The corner-stone of all enduring business is honesty. It matters not whether the principle is applied to the sale of a five-cent article or to a million-dollar article. If the customer feels that he has obtained value for his money and has not been duped he will come back again. Retention of old customers and addition of new ones is the law of business growth.

OUST THE SALE KILLERS

AN authority who has had an opportunity of investigating many businesses in almost every line states that a great fault with many small dealers is, they have little back-bone. The first dull day puts them in a pessimistic mood. They lie down at the first crack of the whip and go so far as to tell a prospective customer about poor business and tight money. This pessimistic talk is not always confined to small dealers, for I can cite a good-sized furniture dealer who recently had a lesson which should last him a lifetime.

He, himself, waited upon a prosperous farmer and his wife desirous of refurnishing their home. After several hundred dollars' worth of furniture had been selected and the farmer was about ready to pull out his wallet to pay for his purchase, this furniture man said, "We are glad to make this sale, you know the war has affected business here in the city—money seems tight, and it's fortunate for us merchants that you farmers have the money to buy." Mr. Farmer turned to his wife and said, "Sarah, if money is getting tight, maybe we had better wait a little while before buying this furniture"—and they did.

Lack of confidence, lack of back-bone and lack of vision has lost many sales. Big business to-day is not being done on a price basis alone. There are exceptions of course, but in many cases the men who are making the most money are those who are out to sell a good product at a legitimate price. Lack of back-bone when it comes to asking a fair price for an article or installation has caused the business downfall of many men. Too many people in business take the view that the buying public is only interested in price. Such is not the case. If you quote a fair, legitimate price you should have no trouble in convincing the prospective customer that he is going to get good value for the money expended. The great trouble is that too many men quote a price and then fail to back it up with a good selling talk if the customer objects to the price quoted. When people have the money to spend they will pay the price for the good article if the merits of the article are played up in the proper light. What we need is more salesmanship and less haggling over mere prices. The subject of "Home Comforts" is a live one to-day, and if any class should, and can get a fair price for home comforts to-day, it is the members of the sanitary and heating trade. Not only do opportunities exist in the villages, towns and cities, but also in the rural communities. One close observer has truly said, as a reward for the arduous labors of the past half decade, thousands of farmers have replaced the old-time stoves with modern heating plants. In like measure there has been adoption of modern plants for supplying water under pressure, which has opened a market for hot water heaters and all manner of plumbing specialties. The installation of home-lighting outfits has followed as a logical sequel in localities where connection could not be made with transmission lines that open to the rural household all the resources of modern electrical appliances.

Canada is aglow with opportunities at the present time, and a close analysis will prove that in many cases the opportunities exist at our very door, and are so obvious that to us they have become common-place and we have been passing them up.

A COSTLY WASTE

PROPERTY valued at more than $40,000 was destroyed in Ontario every day last year. The unfortunate thing in connection with this, aside from the tremendous loss involved, is that the great

percentage of this damage was due to extreme carelessness and might easily have been prevented. Rubbish and fire are twin brothers. One of the most prolific causes of fires was matches, cigar stubs or cigarettes dropped carelessly into rubbish. You can help prevent fire by not allowing rubbish to accumulate. You can help stop Canada's enormous fire loss by using reasonable caution in the storing and handling of oils, gasoline, paints and other volatile liquids. Oily waste thrown anywhere makes a dangerous fire hazard. The high cost of fires has a whole lot to do with the high cost of living in Canada.

KEEP BUSINESS MOVING

TO-MORROW'S dullness may be prevented by to-day's activity. This is especially true in the business world. Business prosperity ultimately depends upon the consumer. A great many people all over the Dominion of Canada have been deprived of a great many things they would normally have purchased, by reason of the restricted production brought about by war conditions. At that time they were told, and it was quite true, that the patriotic thing to do was not to buy, not to consume materials that were urgently needed for winning the great struggle. Now, however, it is patriotic for people to start buying again just as rapidly as they can. Perhaps the very quickest and surest way to get people buying again is to put on a strong advertising campaign. Both manufacturers and retailers are interested in keeping business moving steadily. Intelligent advertising has time after time proved its value in creating a demand for products. It will, if given a chance, do the same thing now.

VALUE OF ASSOCIATION

MANY men, especially younger men, do not always realize the important bearing that choosing their associates has upon their future. Mingling with men who are successful, and who are accomplishing things, is a wonderful stimulus. Association with men who are always bright and optimistic will give one an entirely different outlook on things. The reverse is also true. If men spend their time with those who are not ambitious, they generally turn out the same way. It will make all the difference in any man's career if he keeps close to those whose actions will inspire him, and avoid those whose course in life tends to discourage him.

THE HOUSING SCHEME

REQUEST after request for Government funds to help in relieving the shortage of dwellings is being received by J. A. Ellis, who is directing the work in Ontario. Nearly $5,000,000 has already been asked for by twelve of the smaller cities and towns and requests are now being prepared and will be presented within the next thirty days by fifteen others. Mr. Ellis expects that by June there will be at least fifty or sixty municipalities who will have their housing propositions well under way. General reports that come in from all parts of the country, indicate that a large amount of construction work is under way and that more is constantly developing in spite of the high prices of materials. In some sections a scarcity of brick and lumber has developed, which is retarding construction that would have gone forward. Dealers in builders' supplies report that business has only been fair in comparison with normal conditions, but that it shows, as far as the building situation is concerned, a decided increase over similar periods in the past three years. Details of the provisions of the Ontario Housing Act appeared in the previous issue of SANITARY ENGINEER.

TACT IS NEEDED

WHILE the primary function of the collector is to get the money, the ways and means of doing it must be carefully considered in order that the tree may not be damaged in gathering the crop. There exists between the debtor and creditor a bond of mutual interest and obligation which works to the advantage of both, if faithfully observed and respected. We should insist courteously, kindly, but none the less firmly, not only upon payment of accounts but upon payment when due.

SHORTENING CREDIT TERMS

MANUFACTURERS and wholesalers have found it necessary to shorten credit terms and it seems an assured fact that the future, instead of witnessing a return to previous conditions, will see the tendency to stricter terms more and more accentuated. It has become a positive necessity. The more or less free and easy finance of the days of hectic prosperity will never again be possible.

To the merchant this means only one thing. He must in turn shorten the terms of credit that he allows his customers. It is quite safe to assert that the average merchant is altogether too lenient or too negligent in the matter of collections. He is inclined to let things slide, probably because he is afraid of offending his customers. In every locality there are well-to-do farmers, for instance, with comfortable bank balances who let their bills run on until they seem like the brook which "runs on forever." A few customers like this and the merchant, in order to keep things going, has perhaps to go to the bank for funds. Courteous firmness in the matter of collections is an admirable and necessary quality these days.

YOUR attendance at the convention will prove pleasant and profitable to you and will help to bring about better conditions in the trade. Don't forget, Montreal, June 3-4.

Heating and Ventilating

COMPARATIVE STANDARDS

Second Article of Series Prepared For Readers of the "Sanitary Engineer" by N. A. Kearns

Editor's Note.—This article is the second of a series prepared especially for the readers of SANITARY ENGINEER, covering heating and engineering practice reduced to its simplest terms. The first article of the series appeared in the April 1 issue. Descriptions of installations made in different classes of buildings will be given, together with the method used in making the designs for these installations. It is not our purpose to give complicated formulas, but rather to present the simple rules that have been based on these formulas, in such a way that the reader will be enabled to design a heating and ventilating system without having to refer to the data given in engineer's hand books. The author of these articles, Mr. N. A. Kearns, has designed heating and ventilating equipment for all classes of buildings in practically every province of the Dominion. Some of the buildings were such that the heating and ventilating equipment had to be installed under the most adverse conditions, whereas in other buildings the design for the heating and ventilating equipment was incorporated in the constructional drawings. The third article of the series will appear in the next issue.

If you have ever watched the expert figuring radiation, you have noticed how quickly and accurately he did his work. The secret of his quick, accurate method was a sense of proportion.

That sense of proportion is the natural heritage of some men, with others it comes from experience. And this experience is the result of their own adventures or the result of taking advantage of the knowledge of other men. There is no source from whence the knowledge of other men's methods may be so easily gleaned as the trade paper. Professional men have their journals and they generally spend more time in reading those journals than they do with any other class of literature. When we read a book on heating we are reading a work that in so far as we are concerned is finished, but when we read an article in a trade paper we know that if there is something in that article that is not clear to us, or that appears to be reasoned from wrong premises, we are at liberty to write and find out what the author of the article meant by certain statements, or to set him right if we feel that he may be wrong somewhere.

With the data that we have gathered from the trade journals and other sources of information we are in a position to make our own comparative standards so that we can estimate our work with rapidity and exactness without having recourse to a great many figures. The principle on which comparative standards are set is the same as that principle where you judge the height of a room by comparing the known height of a door with the height of that room. For instance, if you know that a door is seven feet high, and the wall appears to be about three times as high as the door you estimate the wall at 21 feet in height.

In using comparative standards, the faculty of common sense must be exercised. As an example we might say that a room 12 feet square would require just half the amount of radiation of the room 24 feet square, that is, if both rooms had a like proportion of wall and glass surface exposure, but we know from experience that the larger the room the less radiation it takes in proportion to its size.

Again, we might use the comparative standard where we had two buildings of the same class, and we know that one of these buildings required in hot water radiation an area just equal to one twenty-seventh of the heated cube, our standard would then be one twenty-seventh of the cube in figuring for the other building.

If we take one of the smaller modern brick factories with window surface proportioned to the floor area we may find that one of these buildings with 16,000 feet of glass surface requires just 16,000 feet of steam radiation, so that in a building of like character we could make a snap estimate by using the glass area alone as a basis of comparison.

When we once grasp the idea underlying the system of standards of proportion we will not waste much time in going over the same ground twice, and after figuring a certain type of building we should be in possession of enough data to set a standard for other buildings of like type.

Now we are not arguing in favor of the so-called rules of thumb or that the heating engineer can afford to ignore any information that comes to him by way of class-room experiments. Our contention is that he should not be a slave to set rules and that with a grasp of the first principles of the science of heating he should be able to formulate simple standards of proportion that will afford him the necessary information when required.

The man with a clear understanding of mathematics uses fewer figures in his calculations than the man whose education has not gone past the "rule of three."

The intelligent heating engineer does not despise the so-called rules of thumb when he knows that many of these rules are based on sound scientific principles and that they have stood the test of time.

Just what does this rule of thumb mean? I believe that in its original sense it meant a natural measurement, just as a "span" or "hand" meant a fixed proportion, but that in time the term rule of thumb came to signify the rule for guesswork.

Now we will take one of the very accurate rules that is well known to the trade and reduce this to a simple standard of proportion. This is done in the way of suggestion and it is hoped that the reader will try out a similar system in shortening the processes of other formulae as he comes across them in his reading and then using his own figures instead of relying wholly or in part on the set rules of others.

The formula that we are referring to is that where every element is reduced to equivalent glass surface. The heat loss is figured from this equivalent glass surface and the total heat loss divided by the efficiency of the radiating surfaces. Thus, a room twelve feet square with a nine foot ceiling, two exposed walls, and

a window three feet wide by six feet high,

1. We find the cube of this room is 1,296 feet.

2. The exposed wall is 216 square feet.

3. The glass surface is 18 square feet.

4. The efficiency of hot water radiation is 155 B.t.u. per hour.

1a. We divide our cube of 1,296 feet by 55 (this being the factor for proportioning air to glass surface, as discussed in the first article of this series) and find that this gives us a little more than 23 square feet of equivalent glass surface (E.G.S.). We intend to ventilate our room by changing the air twice in one hour, so we wil consider this 23 square feet of E.G.S. in the wall surface.

3a. We add our actual glass surface to the E.G.S. of the cube and of the wall and find that we have a total of E.G.S. made up as follows:

Cubic content	46 feet
Wall	50 sq. ft.
Window	18 sq. ft.
Total	114 sq. ft.

We will assume that we wish to heat the room to 70 degrees above zero when it is ten below outside. This gives us a temperature range of 80 degrees, and as we found from our experiment that the heat loss through one square foot of glass was one B.t.u. per hour per degree difference in the temperatures on the two sides of the glass we will assume that the loss through 114 square feet of glass would be 114 times 80 degrees, which equals 9,120 B.t.u. (You will notice that the 80 degrees in the glass calculation has been changed over to B.t.u. in figuring the heat loss.)

4a. The efficiency of the hot water radiator being set at 155 B.t.u. per hour, we divide the 9,120 B.t.u. loss per hour by 155 and find that there is nearly 59 square feet of hot water radiation required.

The above example illustrates the method of figuring radiation on the basis of heat loss and the efficiency of the radiator. We could take that rule and use it in such a way as to provide for any set of conditions. For instance, if we were figuring against a temperature of 40 degrees below zero outside, we would consider our temperature range as being 110 instead of the 80 as in this example, and if we were figuring for a low pressure steam heating system the efficiency of 255 B.t.u. would be used as a divisor of the total B.t.u. loss instead of the 155. Or again, if the radiating surface was such that it was more or less efficient than these factors of 155 or 255 B.t.u. we could, if we were in possession of the necessary data regarding the efficiency of these radiators use this same rule with the exception of the dividing factor. The conditions might be such that the window surface would be in the form of a double window which would take just above 40 per cent. less radiation than the single window, or it might be in the form of a skylight which takes more. The wall surface might be such that a dividing factor of four used in reducing this wall surface to glass might be too much or too little, and in a later article we will give constants for heat transmission through the various types of construction.

A first reading of the rule just given might lead one to believe that the rule was excessively long and cumbersome, but it has been given in the above form to show just how a rule that apparently calls for a great deal of figuring can be simplified, and to do this we will take the same rule and work out factors that can be used to give the same results as a longer system of calculation.

1b. The room contains 1,296 cubic feet and estimating on two changes of air per hour the cubic space was equivalent to 46 square feet of glass surface. Multiplying this 46 square feet by the temperature range of 80 and dividing by the efficiency of the radiators, viz.:

1b. 155 we found that we require 23.7 square feet to heat 2,592 cubic feet of air 80 degrees in one hour, so we divide that 2,592 by 23.7 and find that every 109 cub. ft. of air under this condition requires one square foot of radiation.

2b. We take our wall surface of 198 square feet and using the same system of figuring as given in our first example we find that the 198 square feet of wall surface requires nearly 26 square feet of heating surface, or that there is one square foot of radiator surface required for every 7.6 square feet of wall surface.

3b. In the same way we find that our 18 square feet of glass requires about 9 square feet of radiator surface or one square foot to every 2 feet of glass.

Now we have the simple standard of proportion, for a condition as follows:

Hot water heating at 70 degrees inside temperature against 10 degrees below outside and the efficiency of the radiator at 155 B.t.u. per hour.

First, divide cubic contents by 109, multiplying our answer by as many times as we wish to change the air.

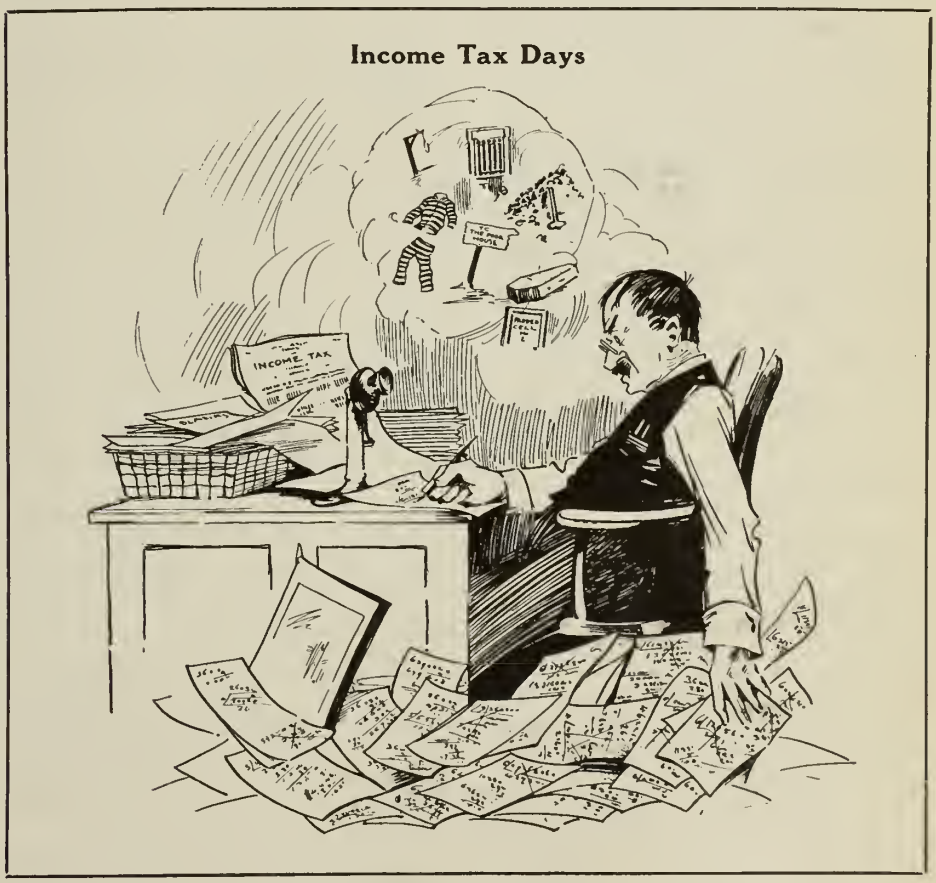
Second, divide wall surface by 7.6.

Third, divide glass surface by 2.

Fourth, add the answers that you have obtained from operation Nos. 1, 2 and 3 and you have the amount of radiating surface required.

Now if the owner of the building decided to use steam instead of hot water it would not be necessary to go over all of the figures of glass surface, cubic contents, etc. All that would be necessary would be to use the comparative standard of the efficiency of a hot water radiator to steam, and reduce the hot water radiation in proportion.

Now it is the usual practice to consider a cast iron steam radiator as having an efficiency of 255 B.t.u. per hour (the American Society of Mechanical Engineers rate them at 244 B.t.u., but for our examples we will consider the efficiency as 255. If we divide 9,120 by 255 we find that our answer is 35.8 square feet, or just about 60 per cent. of the 59 feet we figured for the hot water radiator. So you will see from the above it will be a very easy matter for us to figure our radiation by the rule for hot water and then take 60 per cent. of this for steam, but perhaps we would prefer to figure directly for steam, so



The Head of the Firm "Hell—p"

we make our standards for steam in this way:

It takes 40 per cent. less radiation for steam than for hot water, therefore our dividing factors for the cubic contents, the wall surface and the glass should be such that we will get 40 per cent. less radiation than with the hot water system. In taking our cubic contents first we found that, when we divided 2,592 by 109, 23.7 was the amount of radiation required. Now for steam we want just about 60 per cent. of that 23.7, or in other words a little more than 14 square feet, and 14 square feet is the answer we get when dividing 2,592 by 185, or 70 per cent. more than our divisor for water, so we add 70 per cent. additional to all our factors used in water heating and have a comparative standard for steam as these two tables show:

	Hot Water	Steam
Cubic content	109	185
Wall	7.6	13
Glass	2	3

Now the two rules here given, one for hot water and one for steam, may not be as easily remembered as the rule where we divide the cubic contents by 200, the wall surface by 20 and the glass surface by 2 in figuring for steam radiation. In many cases you would find that the rule of 200, 20 and 2 would give you exactly the same answer as the rule herein given although for a room of the size and proportions used in our example the 200, 20 and 2 rule would call for more radiation than this rule that we have formulated from the heat loss. You will note that a greater divisor is used for the cubic contents in the 200 rule than in the heat loss rule, but that the divisor for the glass surface is considerably less, so that in a room with a great deal of glass area you would find by using the 200, 20 and 2 rule, a larger proportion of radiating surface to glass area than you would have found by using the heat loss method.

It was the intention to describe in this article some types of heating apparatus, but we have already taken up more than our allotted space in this issue and must leave those descriptions for a later number.

(To be continued)

VENTILATING THE MODERN SCHOOL

Second Article of Series Written Especially For "Sanitary Engineer" by N. A. Kearns—First Article of Series Appeared in April 1 Issue

BEFORE we take up the matter of apparatus used in the ventilation of school buildings, it might be well for us to have a little discussion on why we should provide any means at all for ventilating a school building.

It is not so very many years ago that ventilating systems had almost to be forced on many school boards. I can well remember the chairman of the building committee on a certain school board in Western Canada stating that he was against having money spent on a ventilating system. He remarked that he had got on very well without it and that he stood ready to "lick his weight in wild cats" and was sixty years of age. He went on to tell us how as a boy he had walked several miles to and from school each day, and how during the winter he had cut wood between school and bed time. It developed that the proportion of time he had spent in the school room was very low when compared with the time he had spent in vigorous outdoor exercise. He argued against installing a ventilating system in the school, but when he quoted his own personal experience, he, without intending to do so, gave a strong argument in favor of providing some means of providing an adequate supply of fresh air to the children that spent so many hours confined to a school room. When this was pointed out to him he saw the strength of the argument for the ventilating system and gave his support to the men who were advocating the installation.

Ventilating systems have two functions; one of these is to aerate the blood of the occupant of the room and the other to absorb the excess animal heat.

As a rule ventilating systems are installed as a separate unit of the heating systems; but in some cases they are arranged as a part of the heating system.

Examples of both systems will be given in articles following this.

In proportioning the amount of fresh air to a class room it is the general custom to use the amount of carbon dioxide in the air as standard. Carbon dioxide is indicated by the sign CO_2 and as outside air contains 3 to 5 parts of CO_2 in 10,000 parts of air we assume that in our ventilating systems we should not allow the proportion of CO_2 to rise above ten parts in 10,000 and for the best results 6 to 7 parts in 10,000 should be the limit.

If we take the outside air in from an unpolluted source and deliver it in the proportions of 30 cubic feet of air per pupil it is not likely that the proportion of carbon dioxide will rise before the proportions given.

Some of the systems we intend to describe are so installed that, when working properly, a direct displacement of the foul air takes place. Most ventilating systems are so installed that the principle worked on is that of the dilution of the air to the point of relative purity.

In a "direct displacement" system more heat is lost from the building in the operation of the ventilating system than is the case with the "dilution" system. But with the "dilution" system more air must be supplied than with the "direct displacement."

We will first take up "gravity" systems of ventilation when used in combination with steam or water systems.

The first system that we will mention is that known as the "cloth window." In this there are no fresh air flues supplied. Foul air extraction flues are provided and set on the inside walls opposite to the window. The vent faces are set in these flues 3 feet from the floor line and these vent faces have a free area of about 5 feet square for a class room containing 40 pupils. The foul air flues are fitted with "back draft" dampers so that a "blow down" in these flues cannot occur. The flues also have dampers that may be closed when classes are not in session.

The radiators are placed under the windows.

The lower sash is pushed up and its place taken by a sash covered with factory cotton, in the proportion of one square foot per pupil. This system has been used in a number of schools in the United States and the report is that it gives general satisfaction. The writer has had no personal experience with it and is therefore not in a position to make any recommendation.

The second system that we will refer to is that of the "direct-indirect." In this system of ventilation the foul air extraction flues are arranged in a similar manner to those in the "cloth window" system.

A few of the radiators in the room are of the direct-indirect type. Direct-indirect radiators do not differ from the ordinary type, but are placed on special bases that are provided with an opening in their side or at the bottom for the admission of fresh air from the outside. The cold air coming from the outside is heated in passing over these radiators and passes into the room.

With the direct-indirect system a practical displacement of foul air takes place.

The third system to which we will refer is the "indirect." In this system there is a fresh air flue leading to the room as well as the foul air flue leading therefrom.

Each fresh air flue leads from an air tempering chamber at its base. There are set up in that chamber certain cast iron radiators or tempering coils that heat the cold fresh air coming from outside. Each fresh air flue is fitted with a "mixing" damper so that if the air becomes too warm the damper may be set to allow a certain amount of cold air to enter the stack and cool it.

The fresh air escapes into the class room through a fresh face set at about 8 feet from the floor line.

The foul air escapes to the vent flue through an opening or openings at the floor line.

The next system that we will refer to is the so-called "plenum" or pressure system. In this system the air for ventilation is heated in a central chamber and is driven through channels of brick

or galvanized iron to the upright flues leading to the different class rooms. The fresh air enters these class rooms and is extracted from them in the same manner.

Any of the above mentioned installations may also have in addition to the equipment described exhaust fans for removing the foul air. In the absence of a pressure fan and with the use of the exhaust fan the systems are then known as vacuum ventilating systems.

The next system of ventilation described is one where the ventilation system is also used for heating. This is known as the "hot blast system."

First the cold outside air is drawn into a primary heating chamber where it is heated to a temperature of 50 to 60 degrees Fah. It is then driven by a fan through a system of ducts to the radiator enclosures under the windows and in passing around these radiators it becomes heated before it is driven up in front of the windows.

There is also an arrangement of damper with this system so that the temperature of the incoming fresh air can be controlled by the adjustment of the mixing dampers at the base of the radiators.

The foul air may be exhausted from the room through flues situated in the wall opposite to these radiators; but in so far as the heating effect may be concerned it is much better to exhaust it through openings in the floor line or the same side of the rooms as the radiators may be placed.

The following are a few recommendations:

1. Fans should be large enough to run at a low speed, so that the noise of the fan will be reduced to a minimum. The fan should be placed on a well insulated base and its outlet connected to the galvanized iron trunks, if any are used, by means of a flexible canvas connection.

2. The fresh air ducts should be such that they can be easily inspected and kept clean. The cold air should be taken at a point above the dust line.

3. Indirect heater stacks should be set high enough above the water level of the boiler so that there will be no danger of their filling with water. Every return from these radiators should be so valved that they may be valve. The greatest care must be exercised to see that every section is properly vented.

If the sections are placed in series, the first stack exposed to the cold incoming air should not have a valve on the feed. Provision should be made for draining these radiators and returns when they are not in use, and they should be so valved that they mey be used either in conjunction with the heating system or as a separate unit.

REMODEL LONDON SCHOOL

In order to enlarge the lavatories and heating plant and to provide larger playroom space, the London City Council is going to remodel the basement of Central School.

SEES BUSY SEASON AHEAD

Montreal Manager Gives Views Regarding the Future Outlook —Labor a Big Question

Based on an interview by "Sanitary Engineer" representative with C. F. Smallpiece, Montreal manager Taylor-Forbes Company

C. F. SMALLPIECE, Montreal manager of the Taylor-Forbes Company, believes that the present year will witness a great deal of building. To a representative of SANITARY ENGINEER, Mr. Smallpiece stated his reasons for holding this view.

In the first place prices have declined considerably on radiators, valves, pipe and fittings. True, these have not declined to the extent that some would like, but it is very obvious, Mr. Smallpiece said, that they will not reach anything like the levels prevailing before the war. In fact it would be safe to say, "never again," he believed, in the matter of material costs.

Labor a Big Question

Labor has been one of the big questions and is even more so to-day. Men who have been receiving moderate wages in previous times are getting much more to-day, and they will continue to get a high return for their services. Food prices demand that they be well paid. The social status has been raised, and Mr. Smallpiece pointed out that this change for the better was going to be permanent, in his opinion. "Just as the man who received $5,000 for his year's work before the war, and who is now receiving $7,000 will expect this salary to be paid him on the higher basis still, just in the same manner will the man in the shop who has had a proportionate advance expect to still receive the higher wage. He must get more money than he did, as a matter of fact, for his living, and food in particular, is costing him more, and will cost him more."

Continuing, Mr. Smallpiece stated that, while material in the mine would cost no more than it did before, it would cost just so much more as the higher range of wages added to it. Certain he was that the masses must change their viewpoint regarding the cost of a given article.

Peace and Prices

"People must remember that we are living under different conditions and in a different age," was Mr. Smallpiece's way of justifying his idea that a new plane had been reached. It is not fair for one to assume that the world will return to the place it occupied in 1913. It cannot be. Therefore, and the sooner the better, the new order which has been evolved and which must be established calls for a sane, definite, and progressive policy. That this will develop rapidly and that conditions from a building standpoint will be vastly better, Mr. Smallpiece has no doubt.

One of the important bearings at this time is that of the peace settlement which the world nations will be able to make. It may be that a return of building will not come until terms are actually signed, but the change is due, and once a settlement is arrived at, Mr. Smallpiece thinks a large amount of actual work will be laid down.

In the first place, people need, and must have housing. They will, he thinks, come to realize how far away low prices are. This view of the new order of things will come to them gradually and in addition to the need for suitable apartments and houses, there is a great deal of capital which will seek investment. The housing scheme will appeal favorably to those who have piled up profits from war work, and this investment will be a good one.

Then again, money rates are high. In this part of the country where term loans could be had before the war at from 4½ to 5½ per cent., the charge now is nearer 7 to 7½ per cent, and this is likely to remain, thinks Mr. Smallpiece. If it does, there is reason to expect an opening up by those having funds for investment. Altogether, it ought to be a good season, and the start ought soon to be made.

STRIKE INSURANCE NOW BEING ISSUED

A form of insurance designed to protect employers from losses occasioned by labor troubles is to be dealth with by a newly organized company chartered in the State of Maryland, says the Insurance Press, which will provide indemnity covering monetary loss sustained by reason of strikes, computed on the amount of the annual fixed charges during the period of complete or partial idleness.

The company will provide a service for the benefit of both employers and employees and will take a neutral position on the question at issue. It will aim to keep the scales balanced as evenly as possible between the two parties. Many manufacturers have now more to fear from strike losses than from conflagration, it is stated.

MAYOR STATES TORONTO SEWERS INADEQUATE

Mayor T. L. Church of Toronto, speaking of the Bill now before the Ontario Legislature to incorporate the Township of York and to provide sewage disposal of the new municipality through the sewers of the city of Toronto, stated that Toronto's sewage disposal system is not adequate or satisfactory, and that the addition of the sewage from the county would do anything but make matters better, and already Toronto's sewage disposal system is before the courts.

Mayor Church takes the view that the taxpayers of Toronto have enough problems of their own without paying to solve York County's. He doubts the Act's legality.

Labor Cost Plumber's Present Problem

Montreal Plumber Thinks This One of Biggest Questions To-day—Plenty of Men, But Wages High—Workmen More Efficient and Can Earn More—Social Reform Should Have National Attention

Based on an interview by "Sanitary Engineer" representative with J. P. Linton, assistant manager of the Garth Company, Montreal

"ONE of the biggest problems which the plumber has to face to-day, is that of labor, with its demand for higher wages." This is the feeling of J. P. Linton, assistant manager of the Garth Company, Montreal, steamfitters and plumbers.

Mr. Linton pointed out that there was less difficulty in securing good men than there was, but there was no relief in the matter of the wages demanded, and this was partly due to the fact that a great many of the larger railway and other companies were still offering tempting rates to the better men. "One large company is paying some of their men 68c per hour right now," said Mr. Linton. "This makes it necessary for us to pay as much or nearly so."

But the great impediment encountered is that of more or less dissatisfaction, even when the higher wages are paid. Mr. Linton said that, no matter what wages a man was getting—even when they were twice as high as before the war, there was a certain discontent that bordered on unreasonableness. Thus many assumed that, because the manager of a business or someone higher up than they received a larger salary, they also ought to get still more. They never made allowances for the fact that the management had to direct the business and that he had many problems to solve of which they knew nothing. An unfortunate spirit of discontent seemed to linger with a large number of men.

Conditions are Good

Asked as to the condition of business and for his views regarding the outlook in general, Mr. Linton expressed himself as well satisfied. "We have had our men busy right along and have not discharged any," he said. "In addition to this our mechanical department is very busy and we have been figuring on a great deal of proposed work, and this is one of the best indications, for if plans are being submitted for the trade to figure on, it means that they are seriously considering actual building." The omen is a good one.

It was pointed out that a great deal of work was developing from outside, even to a greater extent than within the city. Some large buildings are about to be erected in different parts of the country, and these will, in many instances, call for a superior line of plumbing, heating, vacuum systems, and sprinkler protection against fire. It was evident, Mr. Linton thought, that there would be a great deal of activity this year.

A National Problem

It is significant that Mr. Linton touched upon a point which was also emphasized in another quarter on the same day, and which indicates that employers have a new vision. This was concerning the change in social status which has come about or which is fast developing. Briefly, it consists in the fact that many workers are now living better than they were, not only from the standpoint of better food, but also that of better housing. There was a well-defined desire, Mr. Linton thought, on the part of the average workman to live in a better house and to enjoy in this way many comforts that were not his before. This was as it should be. Better to have a contented class of citizens who were living in real houses than to have unrest perpetuated by continuing the old order, under which many lived in hovels, or little better than hovels.

This matter ought to have the atten-

Continued on page 41

Current Events in Photograph

THE WATCH ON THE RHINE

The photo shows the famous Hohenzollern Bridge, over which the Canadians, with other Allied troops, crossed the Rhine and took up positions on German territory. One of the Rhine motor launch patrols is also shown. Both the bridge and the river are closely watched and guarded by the Allies.

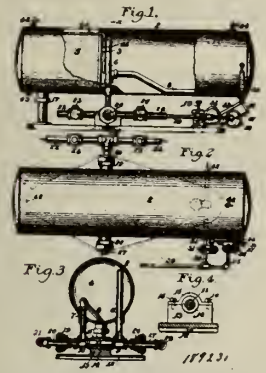
New Canadian Patents

NO. 189,231. STEAM TRAP

Frederick C. Farnsworth, assignee of John F. Nelson, both of Conshohocken, Pennsylvania, U.S.A., 25th March, 1919; 6 years. Filed 30th September, 1918. Receipt No. 299,887.

Claim—1. In a trap of the character stated the combination of a base having a bearing formed thereon, a tilting trap body having downwardly extending pipes opening from interior thereof, said pipes at their lower ends having oppositely directed branching portions in the same transverse alignment and unobstructed at all times, and a journal portion secured between the lower

No. 189,231. Steam Trap.



ends of the two pipes and their branching portions and in alignment with said branching portions and providing a seal between them, said journal portion seated in and adapted to oscillate upon the bearing of the bed plate, said journal portion forming a permanently sealed union between the two pipes and their branching portions, and in which further the pipes and their branching portions provide hubs at ends of the journal portion to position it upon the bearing.

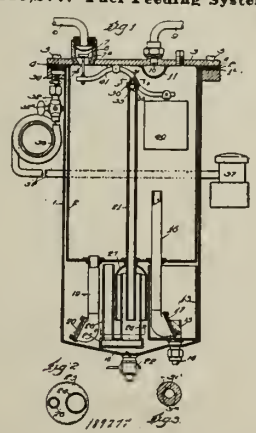
Claims allowed, 8.

NO. 189,235. HEATING MECHANISM

David Wiley Anderson, Scottsville, and Archibald Douglas Dabney, Charlottesville, co-inventors, both in Virginia, U.S.A., 25th March, 1916; 6 years. Filed 2nd December, 1918. Receipt No. 302,130.

Claim—1. An automatic heat regulating and fuel saving attachment for heaters of various kinds, comprising a main air draft chamber, a regulating air draft chamber, a partition positioned between said chambers provided with an opening therethrough, an automatically operated damper loosely suspended within said regulating chamber adapted to control the passage of air through said opening, means for controlling the

No. 189,277. Fuel Feeding System



admission of air to the main air draft chamber, a removable cap secured to the outer end of the regulating chamber, means secured to said cap for regulating the admission of air into the last-named chamber, and a flanged portion adapted to be secured to a heater formed with an opening therethrough for the discharge of air from the main air draft chamber to the fire portion.

Claims allowed, 17.

NO. 189,277. FUEL FEEDING DEVICE

William H. Muzzy, Chicago, Illinois, U.S.A., 25th March, 1919; 6 years. Filed 18th November, 1918. Receipt No. 301,639.

Claim.—1. In a device in which liquid is alternately lifted from a lower source into a higher chamber by suction, and discharged therefrom upon relief of the suction, the method of timing the alteration of suction and relief therefrom which consists in producing a circulation of liquid in a path which returns upon itself, in which path is located an air intake through which the suction in said chamber is relieved, and which is sealed by the liquid returning in said path to the location therein of said intake.

2. In a liquid feeding system in which the liquid is lifted by suction from a lower source to a higher vacuum chamber and delivered from the vacuum chamber upon relief of the suction therein, the combination with the vacuum chamber, of devices for governing the suction and relief thereof to cause the suction and relief to recur in definite cycles independently of the quantity of liquor lifted or the quantity delivered.

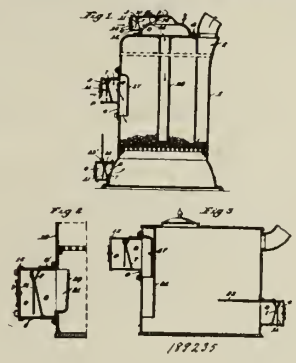
Claims allowed, 21.

NO. 189,279. VALVE FOR FLUSHING TANKS.

Thomas J. McCaffrey, Seattle, Washington, U.S.A., 25th March, 1916; 6 years. Filed 24th December, 1918. Receipt No. 303,080.

Claim.—1. A flushing siphon having an inlet leg and a chamber operatively connected to the inlet leg of the siphon, the inner wall of the inlet leg extending below the top of the chamber and the

No. 189,235. Heating Mechanism.



outer wall of the inlet leg terminating at the top of the chamber, a stem movable vertically through said chamber and extending straight upward for its entire extent, and a lifter plate loosely mounted on the stem for vertical movement upward independent of the stem for the entire length of said chamber, to thereoy pass the lower end of the inner wall of the inlet leg, the stem having independent movement downward relative to the lifter plate and having a stop on its lower end upon which the lifter plate normally rests.

Claims allowed, 2.

NO. 189,302. HEAT DISTRIBUTING DEVICE.

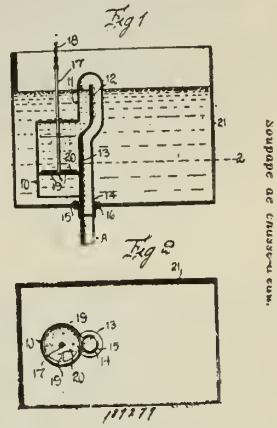
Frank W. Stevens, Albion, Iowa, U.S.A., 25th March, 1919; 6 years. Filed 13th November, 1918. Receipt No. 301,408.

Claim. 1. A heat distributing device comprising a floor formed with a hole, a furnace casing communicating with said hole, a partition formed with a hole above and communicating with the hole in the floor, a templet of triangular shape mounted in the upper portion of the latter hole and having deflecting walls overhanging the hole in the floor, a register overlying the hole in the floor, said templet being formed with a longitudinally extending slot over the hole in the floor, and a damper extending through the slot in the templet and adapted to be moved across said register.

2. A heat distributing device comprising a floor formed with a hole, a furnace casing communicating with said hole, a partition formed with a hole above and communicating with the hole in the floor, the sides of the hole in the partition being lined with brick and formed with facings of mantel and plinth on either side of the partition, a templet of triangular shape mounted in the upper portion of the latter hole, and a damper projecting within and extending downwardly from said templet and adapted to be moved across the register.

Claims allowed, 2.

No. 189,279. Valve for Flushing Tanks.



NO. 189,303. DOMESTIC HEATING SYSTEM.

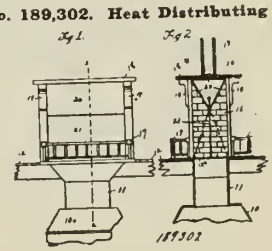
Alfred H. Thompson, Venice, California, U.S.A., 25th March, 1919; 6 years. Filed 10th September, 1918. Receipt No. 299,198.

Claim.—1. In a domestic heating system, the combination of a hot water circuit including a distributor, a domestic tank, and a heater, the distributor, a domestic tank, and a heater, the distributor being situated substantially above the level of the domestic tank, and the domestic tank being situated substantially above the heater, a radiator, a pipe communicating with the hot water circuit near the upper part of the domestic tank, said pipe leading to said radiator, a pipe leading from said radiator and communicating with the lower portion of said water circuit.

3. In a domestic heating system, the combination of a water circuit including a distributor, a domestic tank, and a heater, the distributor being situated substantially above the level of the domestic tank, and the domestic tank being situated suostant.al.y above the level of the heater, a radiator, a pipe communicating with the water circuit above the tank and leading to said radiator, a pipe communicating with the lower portion of said water circuit and also leading to said radiator, a valve in one of said pipes leading to said radiator, a valve in the water circuit, service cocks, a pipe communicating with the upper portion of said water circuit and leading to said service cocks, and a supply pipe for the system.

Claims allowed, 6.

No. 189,302. Heat Distributing Device.



NO. 189,304. HEATING SYSTEM.

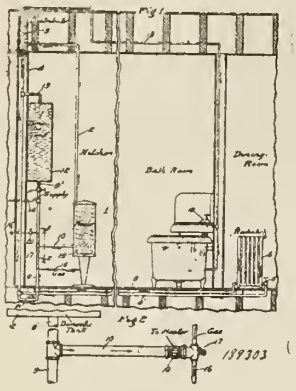
Alfred H. Thompson, Venice, California, U.S.A., 25th March, 1919; 6 years. Filed 13th November, 1918. Receipt No. 301,443.

Claim.—1. In a combined hot water domestic and heating system the combination of a hot water circuit including a closed distributor of substantial capacity, a heater and a radiator, the distributor being situated above the level of the heater, a service cock, a pipe leading from the top of said distributor to said service cock, and a supply pipe for the system, said supply pipe being adapted to produce pressure in the distributor and said distributor forming an enlarged chamber of substantial capacity capable of accommodating any accumulation of air or steam likely to occur in the system under the pressure of the water supply, and to prevent such accumulation of air

or steam from reaching the circuit and thus stopping the circulation of water through the heating system, the pressure in said distributor operating to force the water through said service cock.

Claims allowed, 5.

No. 189,303. Heating System.



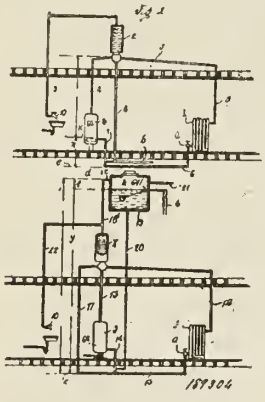
NO. 186,306. STOVE SPARK ARRESTER. Emil Zimmerman, Butternut, Wisconsin, U.S.A.. 25th March, 1919; 6 years. Filed 4th November, 1918. Receipt No. 301,094.

Claim.—1. A spark arrester comprising a rotatable rod, and a plurality of arcuate rods carried by the said rotatable rod and arranged to comprise two series of rods, one disposed above the other.

3. A spark arrester comprising a rotatable rod, a circular ring carried by the rod and adapted to be rotated therewith, two series of arcuate rods having their terminals fastened to the ring, and a supporting rod for each series of rods.

5. A spark arrester comprising a rotatable rod having a handle formed at one end thereof, a ring supported by the rod and adapted to be rotated thereby, a series of rods of arcuate formation having their terminals fixed to the said ring, and a second series of rods of arcuate formation having their terminals fixed to the said ring, the arc of the second series of rods being greater than the arc of the said first series, the rods of each series extending across the ring in equally spaced relation to each other, the rods in the said second

No. 189,304. Heating System.



series being disposed above the centre of the space between the rods in the lower series, and a supporting rod for each series of rods.

Claims allowed, 5.

KINGSTON LOSES SANITARY INSPECTOR

Nicholas Timmerman, for the past three years garbage and sanitary inspector of Kingston, Ontario, has handed in his resignation to the City Council. Mr. Timmerman, who is resigning on account of ill health, is a native of Holland. He came to America in 1873, and after a few years in Buffalo moved to Kingston, where he served the city continuously for thirty-three years, thirty years on the police force and latterly the sanitary inspector service.

CONVENTION REPORT

Continued from page 25

Letter from C. Clapperton

Mr. G. E. Frankland, Secretary,
Ontario Society of Domestic and Sanitary Heating Engineers, College St., City.

Dear Sir:—Replying to yours of March 29th, and as directed by our President, Mr. F. R. Maxwell, the writer hoped that he would have the opportunity of addressing the meeting on Friday in regard to the apprenticeship problem, but owing to other arrangements may not be able to do so, and begs to submit the following suggestions to our president which he can bring before the meeting if he so desires.

Mr. Maxwell in commenting on the apprenticeship question thought it would be well if five members were appointed throughout the province, these to meet at stated times. The writer thinks this would be a good idea, but feels that probably better results might be obtained if we could get from the different towns and cities suggestions on the said question, so that when the Toronto Committee present their findings to the Toronto Society they will be able to present something that might be not only of interest to Ontario at large, but a system that might be suitable for all.

Your Toronto Committee are giving the question a good deal of thought, and hope to present to the Association at their May meeting a system that would be workable, and in any case food for discussion. We are strongly of the opinion that every member of our Association should do his part in trying to teach boys not only to be mechanics, but to be of good moral standing, and to have a technical knowledge of the business when they strike out for themselves.

Our country is of large area, and sparsely inhabited at the present time, but we are confident that the future holds great possibilities for the population to increase rapidly, and the rapidly growing towns and villages will have to depend on the mechanics from the city. We feel that in the City of Toronto we require from 15 to 20 full-fledged mechanics each year to take care of the wastage.

Our recommendation will further recommend a course of technical training. We are taking this question up with the principal of the Technical School as to the best course of procedure along this line. We also intend taking the question up with the Jonrneymen's Association, so that we will have their co-operation and assistance in our endeavors to give the boys every opportunity to know our business thoroughly.

We would like very much to interest all the Ontario members and have written suggestions from each centre if this could be arranged.

You have further asked for any suggestions as to the further operations of the Society in regard to organizing of the craft. We believe there are only two ways this can be done, that is by propaganda, or by sending an organizer through the district. The writer believes the propaganda should be tried before we go to the expense of sending an organizer out.

Wishing you every success in your deliberations on Friday, I remain,

Yours truly,
G. CLAPPERTON.

The Sanitary Engineer His Wants and How They Are Supplied

Report by Henry E. White, Brantford, Ont., chairman of Apprenticeship Committee, before meeting of Ontario Society of Domestic, Sanitary and Heating Engineers.

WHAT are the wants of the sanitary engineer? What conditions does he need to have fulfilled so that he can conduct his business in a proper manner, and thereby make a living for himself and family, and incidentally help the community in which he lives?

These wants may be roughly divided under three headings:—

First.—Opportunity to work, sell material and labor.

Second.—Opportunity to buy the goods he needs.

Thirdly.—Opportunity to obtain the labor necessary to install the goods when sold.

Let us now take these under separate headlines and see what is to be done in reference to them.

Opportunity to Work

Opportunity to work, for a profit, for bare wages or a loss. That is largely determined by the methods of the man himself, if he is one of those who thinks chiefly of getting the job he will have lots of the latter. All the work in this old world is not yet done, neither are all the deadbeats extinct, in any event if he is any good at all as a workman he will have lots of opportunities figuring on work which if he is lucky will only get a small percentage of.

Goods or Merchandise

If he is fortunate enough to be possessed of a little ready cash the road to buying is easy enough, and the ever ready supply man soon has him loaded up to the limit, he may even get some credit if he looks good enough. As to his disposal of the goods at a profit that largely depends upon whether he uses judgment in buying them, or whether he lets the salesman wish them on to him.

Whether he recognizes it or not right here is the point where he has got to round out his business policy or go broke. Every dollar's worth of goods he buys carries its corresponding amount of labor for the ultimate delivery of the goods before he can even look to see whether he has got a strangle hold on that very elusive thing called **profit**, so that it can be fairly assumed as a maxim of the trade that a merchant in the sanitary engineering business must employ help in a proportionate number to the quantity of goods he buys.

Now the average merchant prides himself not a little on his buying ability, he follows the market reports, he balances up his stock, he endeavors to shift the shop-worn goods off the shelves. To keep things moving he will plan ahead and generally handle his material in a business-like way by turning the dollar just as often as possible.

Now if the employer would give the same attention to his labor problem as he does his merchandise, handle them ahead of time, provide for the future as he should, we would not hear so much about the shortage of skilled help. The fact that he has not been doing this seems to imply that there must be reasons for this omission, and to remedy this trouble we must first find the cause.

Some of the causes for lack of apprentices to the trade are suggested as follows:

A natural dislike of the present-day youth to be bound to any employer.

The opportunity in the last few years to make abnormal wages at other employment.

A want of concerted action on the part of employers in handling the question.

The opposition of the general public to the apprentice being used on their particular job.

The present high standard of efficiency which all good merchants aim at, and which is absolutely necessary for the success of the business, which works automatically against the inclusion of any person who is unable to carry on alone.

The high cost of materials, which entail more losses when handled by other than efficient workmen.

Continued on next page

Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published--Description of Jobs Done or Shop Kinks Are Also Invited.

LACK OF AIR

Question—I have a hot water furnace in my house and have had it for about four years. Last winter I began to have trouble with it from the first of the season. Every winter before that it gave excellent service. My house was always warm and I have recommended the boiler to a number of my friends. They now have the laugh on me. Any time any of my friends come in I am sitting in front of the kitchen stove trying to keep warm. It is most exasperating. I have had a couple of men in here from the people that installed it and they said it was my chimney. I cannot see how that could be the cause as the chimney was allright from the first. I have had the chimney cleaned and a new smoke-pipe put on the furnace. There is nothing wrong with the chimney. The damper is not stuck in the smoke-pipe and the smoke-pipe fits tight into the thimble in the chimney and on to the furnace. If I leave the feed door open on the furnace the fire burns better than when the feed door is closed, sometimes the fire goes right out with all the drafts open. The fuel will not even smoke but just goes out. I know it is not the coal, as a neighbor of mine is using the same coal in his boiler and getting good results.

Answer—From the description of your trouble it would appear that the fire does not burn in your boiler because of the lack of air necessary for proper combustion. It is likely that last spring some ashes were left on the grates, these ashes became damp and hardened between the teeth of the grates, so that no matter how much shaking you gave the grates the hard ash would not dislodge. You should have a man clean out the hard ash from between the grates with a file, and if you have any trouble in getting the fire to burn properly after this let us know.—Ed.

THROWS OFF 966 B. T. U.

Question—I have read that it takes one heat unit to raise one pound of water one degree and a pound of water condensed from steam evaporated at a temperature of 212 degrees gives off 966 heat units. I cannot see how this can be right, for if the temperature of the steam is only 212 degrees and there is a pound of water in that steam there cannot be more than 180 B. T. U.

Answer—When one pound of water in an open vessel over an open fire reaches the boiling temperature it does not increase any more in temperature, but begins to change to steam. It takes just 966 heat units to change that pound of water to steam and the steam in changing back to water throws off that 966 B. T. U. before it starts to cool.—Ed.

THE SANITARY ENGINEER

(Continued from page 38)

The strictly business proposition of whether the work is done in less time when there is an apprentice on the job or not?

We have been used in the past days, that is, in pre-war times, to having our workmen come along without much effort, selling his labor as best he might, like the salesman from the supply house sold his goods and we got good and bad articles from them both: that time seems to be past. It is not in the interests of the journeyman to perpetuate his race, at least he does not think so, he imagines he has more to gain by keeping out the apprentice. Is it good business on our part to go on building up the one part of our business and giving no attention to the other? Personally I would think not. Let us get together on this work and if we decide apprentices are needed let us get after them the same as we would any other part of the business, with a regular, well-defined plan of action common to us all.

In conclusion I would ask you to consider closely the bulletin issued by the Industrial Commission of Wisconsin on the apprenticeship System and reprinted in THE SANITARY ENGINEER of March 15th, which contains many valuable suggestions, including the following:—

The Apprenticeship Plan

A solution to apprenticeship cannot come where either one or the other side of the trade assumes exclusive control. Apprenticeship controlled entirely by the employees, or the union, is bound to meet with dissatisfaction on the part of the employers, if not of the boys. On the other hand, apprenticeship controlled entirely by the employers without regard to the rights of journeymen in the trade is likewise sure to bring unsatisfactory experience. This has been borne out in the past, and the twenty years of discussion in trade associations in the plumbing business have revealed the decline of proper apprenticeship in the trade, and have also brought to light the troubles which arose when either the union or the employers attempt alone to govern apprenticeship. Effective administration of apprenticeship must come through joint control and is best assured when the state takes a hand and administers the regulations with the interest of the public at heart. This interest is chiefly in the welfare of the apprentice who is to be the future tradesman.

FINANCIAL STATEMENT OF THE ONTARIO SOCIETY OF DOMESTIC SANITARY AND HEATING ENGINEERS FOR 1918.

Year ending January 31st, 1919

1918	Receipts		
Feb. 1	By Bank Balance..	$695.08	
	By Dues Rec. from secretary	605.00	
			$1,300.08
1918	Disbursements.		
Feb. 1	To Annual Government Fee	$ 1.00	
April 5	To G. F. Frankland, expenses	25.50	
June 29	To E. H. Russell, Endowment Fund Loan	125.00	
June 29	T. G. F. Frankland, in trust, special loan	160.00	
July 11	to G. F. Frankland, expenses	25.00	
Nov. 16	To Can. Society, per Capita, 1918.....	100.00	
Nov. 16	To Finance Minister of Canada, bond...	500.00	
1919			
Jan. 31	To G. F. Frankland, expenses	10.00	
	Total disbursements.....		$ 946.50
1919			
Jan. 31	Balance in Bank.....		$ 353.58
			$1,300 08

ASSETS ON HAND
January 31st, 1919.

Office Furniture, Charts, Records, Stationery and books.....	$	100.00
One Five Hundred Dollar Dominion of Canada Victory Loan, 1918 bond		500.00
Bank balance		353.58
Total amount	$	953.58

The firm of Duhamel&Fils, plumbers, has been registered in Montreal by Jos. Duhamel.

News from Here and There

CONTRIBUTIONS OF NEWS GLADLY ACCEPTED

QUEBEC PROVINCE GOSSIP

E. G. Brousseau and Frere, St. Joseph Street, Quebec, are engaged in installing the heating, plumbing, and vacuum work in the new St. Patrick's School. This is an extensive piece of work and will take months to complete, the contract, it is understood, running to nearly $35,000.

John R. Meadowcroft, manager of the Garth Company, Montreal, will have the sympathy of his many friends in the loss of his mother, widow of the late Thomas Meadowcroft, and who died in Montreal on March 24.

E. C. Townsend, manager of Crane, Limited, Montreal, has returned from England, where he spent several weeks on special business.

John R. Meadowcroft, manager of the Garth Co., Montreal, has been convalescing from his recent sickness at Atlantic City.

John Watson and Co., 4145 St. Catherine St. West, Montreal, have been adding electric lamps to their lines. These are being freely displayed in the store window and Mr. Watson expects that a trade can be developed for this line.

The firm, J. W. Hughes & Son, plumbers, of Montreal, was registered recently. The head of the firm, one of Montreal's leading master plumbers, W. R. T. Hughes, died very suddenly on February 15th last. The new members of the firm will be Mr. A. W. Hughes and Mr. U. W. Hughes, sons of Mr. W. R. T. Hughes, and grandsons of the founder of the firm.

RECENT REGISTRATION

The firm of J. Duhamel & Fils, plumbers, was recently registered in Montreal.

NEW FIRMS

The firm of Peterson & Pyke has recently commenced a plumbing, heating, and power work business at 38 Arthur Street, Winnipeg. Messrs. Peterson and Pyke were formerly employed by Cotter Bros., Ltd., of Winnipeg, the former as a plumber and the other as a steamfitter.

NEPTUNE COMPANY TO LOCATE IN TORONTO

The Neptune Meter Co. of New York, claiming to be the largest manufacturers of water meters in the world, have acquired the munition factory of the Russell Motor Car Co. at Dufferin and King Streets, Toronto, as a branch factory. The company has been in the Canadian field for some time, having a factory at Hamilton.

To operate the Toronto factory a new company is being formed to be known as the Neptune Meter Co., Ltd. J. Herbert Ballantine is to be president of the new company, J. B. Kirkpatrick secretary, Benjamin B. Vanderveer vice-president, and W. H. Randall general manager.

TRADE NOTES

The Owl Metal Co., Limited, Winnipeg, have started the manufacture of soldering salts, liquid and paste. They are also preparing to put out, when their new plant is completed, copper, red brass, yellow brass and bronzes in ingots.

N. B. ROONTREE

Of Swift Current, Sask., who as announced in the April 1 issue of Sanitary Engineer was elected President of the Provincial Association of Saskatchewan Sanitary and Heating Engineers.

Frederic Sara, manufacturers' agent, Calgary, Alta., has added to his other lines the agency for Cannon Iron Foundries, Ltd., Deepfields, near Billston. Staffs, England, for their lines of hollowware, castings, enamelled bath supplies, fittings, etc.

MAY SPEND $6,000,000

At least $6,000,000 will be expended, it is stated, by the General Motors Corporation in construction work already commenced, on their 38 acre site at Walkerville, Ont., purchased some months ago.

This announcement follows that made by W. C. Durant, of Detroit, president of the G. M. C., of an extension program involving a total expenditure approximating $37,398,000.

For several weeks men have been engaged in tearing down the old buildings on the site located on the Walker Road, preparatory to the commencement of building operations on the new factory.

APPOINTED ASSISTANT GENERAL MANAGER

John M. Gunn, foundry manager of the McClary Manufacturing Co., London, Ont., was recently elected a director of the company, and promoted to the position of assistant general manager. H. V. Kenerson, who has been head of the cost accounting department takes the position of foundry manager. Mr. Kenerson was released by the company to join the American army but has received his discharge.

SANITARY INSPECTOR HAS SPECIAL COP

Captain Alan Curry was duly appointed sanitary inspector of Sydney, Nova Scotia, at a salary of $80 per month, at a meeting of the Civic Board of Health on April 1st.

Mr. Curry will be backed up during the month of May and June when most of the work of inspection will likely be done by a special policeman, the idea being that a man in brass buttons following Mr. Curry would make backward householders more amenable to discipline.

The city charter of Sydney is being amended to permit the punishment of persons selling adulterated milk. A special war will be made on houses unfit for human habitation.

COMBINATION STORE

Sergt. T. Britton of Clifton, Ontario, has a novel combination for a small general store. He deals in electrical and plumbers' supplies, fruit, vegetables and flowers. Tommy, as Sergt. Britton is locally known, opened his store on March 29th.

PRESTON MAY APPLY FOR $150,000

The Board of Trade of the town of Preston, Ontario, is recommending the Town Council to apply for $150,000 under the provisions of the Ontario Housing Act, which was cited in the last issue of SANITARY ENGINEER, to relieve the housing problem.

Mr. George Mather, of the Board of Trade, who had been commissioned to draw up a tentative plan and to obtain a price on it presented his report.

He had plans for two sizes for houses. The smaller of these was brick veneer one and a half stories in height. The ground plan was 20 x 24 feet. It would contain living and dining rooms, kitchen, bath, bedrooms, and back porch, cemented cellar, rainstorm cistern, spruce floors, pine finish, pipeless furnace, and the necessary plumbing and electric wiring. The plumbing is connected up to the sewer. The electric fixtures and cement walks are not figured in. This house would cost $2,100 exclusive of land, while the larger house, which is a full two stories in height, and has a ground plan 24 x 26 would be about $300 extra.

PUDDLERS' WAGES DECREASE

Wage rates of puddlers of the Bethlehem Steel Co., at its Lebanon plant, have been readjusted on the basis of the new bar iron price of $2.35 per hundred pounds. No change was made in the wage schedule when the bar iron price was cut from $3.40 to $2.90. The last reduction in the price of iron, however, made an aggregate so large that a scaling down of wage rates, based on sale prices, was necessary, says a representative of the company. Several hundred puddlers and helpers are affected.

WILL TAKE ADVANTAGE OF ONTARIO HOUSING ACT.

Hamilton, Ontario, has nominated a committee composed of City Clerk Kent, Industrial Commissioner C. W. Kirkpatrick, City Treasurer W. R. Leckie and Building Inspector W. J. Whitlock, to prepare a report on advisability of adopting the Ontario Government's Housing Scheme and ways and means of working under it.

TO COMBINE SYSTEMS

An effort is being made to combine the waterworks of the four border cities on the Detroit River into one. The Essex Border Utility Commission authorized its solicitor to prepare a by-law to that effect for submission to the ratepayers of Windsor, Walkerville, Ojibway and Ford City.

James Sanderson and Company have purchased the plumbing and heating located at 1736 St. James Street. This business will be continued at the old stand at the address above given.

JOHN WATSON

Secretary-Treasurer the Canadian Society of Domestic Sanitary and Heating Engineers, who is working hard in an endeavor to make the convention in Montreal on June 3-4, the best on record. Mr. Watson states that encouraging reports are coming in, especially from Ontario, Quebec, Saskatchewan, Manitoba and Alberta. Mr. Watson would like to hear from British Columbia, New Brunswick, Nova Scotia and Prince Edward Island. How about you, boys?

SETS UP IN SARNIA

Clark Turner, of Sarnia, Ontario, returned from the East last week, where he has been purchasing machinery and stock for his new plumbing business. Mr. Turner's address will be Victoria Street North, and he will handle plumbing, sheet metal and heating work. Mr. Turner is well-known to the plumbing trade in Sarnia, having spent twenty years in the employ of W. J. Barrie, of that city.

A Peculiar Case.—Ex-Ald. Thomas Roden and a deputation of the Canadian Manufacturers' Association waited on the Toronto Board of Control to record their objection against the city's interference in the trouble between the Gutta Percha Rubber Company and the residents of West Lodge avenue, who complain of the incessant vibration of machinery on the plant. Mr. Roden, who was the spokesman of the deputation, stated that all the manufacturers of the city were concerned over the action of the Health Department in summoning the offending company to the police court for maintaining a nuisance. Industries, he said, should be encouraged to come here. "The street railway runs 24 hours a day," he claimed further. Mayor Church reminded the deputation that the people in that district were unable to sleep at nights. To Controller Maguire Mr. Roden admitted that no members of the association had been to visit the plant, but the stoppage of the machinery that caused the noise would throw 1,500 men out of work.

On the Side

HELPFUL CORPORATION

Pat: "This is the foist time inny of these Montreal corporations hev done innything to binnefit the workingman."

Mike: "How is that, Pat?"

Pat: "It is this six-cint fare. I hev bin walkin' to and from me work and savin' tin cints, and now I kin save twelve."

SELF PRESERVATION

Pat Flinn was sent to fix a radiator at the residence of a Toronto millionaire, and as he entered the front hall the butler, in a subdued voice, said:

"You are requested to be careful of the inlaid floors as you go through the halls. They have just been waxed."

"Oh, sure there's no danger of me slippin' on thim," replied Flinn. "I've spikes in me shoes."

SOME RAM

Recently there arrived at the United States Department of Commerce a letter from a foreigner asking that the writer be given the names and addresses of manufacturers of male water sheep. Maybe that wasn't a poser! For a week no one in the department, rack his brains as he might, could imagine what this man wanted. Many employees were called in and it remained for a woman to shed light on the situation. The woman read the letter and then said:

"Why, I think he means hydraulic rams."

And that was what the foreigner was inquiring about.

BAD FOR HIS CLIENT

Lawyers frequently make ludicrous mistakes. One lawyer not as discreet as he might have been in the expression of his ideas was engaged on a case concerning some pigs.

"Gentlemen of the jury," he began, "there were twenty-four pigs in the drove, just twenty-four; exactly twice as many as there are in that jury box."

LABOR COST PLUMBER'S PRESENT PROBLEM

Continued from page 36

tion of the state and not of the individual. It was a big problem, to be undertaken in a national sense. If the proper attention were given the matter the results would justify the attention given.

Efficiency is Greater

Whilst the average good plumber or steamfitter could and did produce well before the war, he is now a better workman. It is one of the points justifying the higher wages which he is now receiving. This, Mr. Linton thinks, was made possible through the use of machinery and because of the war requirements. A man had been given a certain work to perform. He had, under the temptation of higher pay, developed himself in efficiency along that particular line. The result had made of him a better workman and a much speedier one. In this way he had been able to deliver a greater amount of real work in a given period, and was therefore entitled to the larger wage scale. Were he able to temper his ideas regarding remuneration with reason there would be little complaint to make.

SOME FEATURES OF PREVIOUS ISSUE

First article of new series on heating and engineering practice, by N. A. Kearns.

Details of the Ontario Housing Act which was recently passed.

Message from vice-president of Canadian Society Domestic Sanitary and Heating Engineers.

"Be a Booster." Article on the coming convention.

"Solving Your Housing Problem." Illustrated article giving experience of one Canadian industry.

Warning re Bulk Sales Act.

What other members of craft are doing.

Details of proposed new Department of Health at Ottawa.

Larger Loans Made For Better Houses

Government Anxious to Encourage the Use of Better Building Materials

One result of the co-operation of the Commission of Conservation with the Housing Committee is that there has been introduced into the recommendations to be made by the Federal Government something that will help to avert a certain amount of fire waste which goes on in connection with houses. The Government of Ontario limits the amount which may be spent on a house to $3,000. The result will inevitably be that cheaper material will be used, and in the Commission's recommendation to the Dominion Government it was suggested that for a frame house with brick veneer, or frame house with stucco and shingle roof, the loan be for $3,000 if the house contain four or five rooms, and for $3,500 if there be six or seven rooms; and that if the house be built of brick, stone or concrete, with fireproofing material, the loan be $4,000 for three or four rooms, and $4,500 for six or seven rooms, the period of payment being 30 years instead of 20, at five per cent. The result will be that every man who wants to build a properly constructed house not only can get a larger sum, but can get it on the same monthly repayment plan as that of which the man who builds the cheaper house has the benefit. In other words, a man can get $4,000 for thirty years on the same monthly repayment plan as the man who builds the cheaper house can get $3,000 for twenty years. Of course, the payments in the case of the larger loan extend over a longer period, but the owner has a house of more durable construction. That principle has now been adopted and will be a direct recommendation by the Dominion Government. In adopting these recommendations the Government is taking a step forward in recommending the adoption of town planning principles in connection with housing schemes and in furthering these measures to secure the best methods of construction.

MONTREAL SHARE IS $5,000,000

Montreal's share of the Federal grant to erect homes for the working man is five million dollars. This amount is to be handed over to the civic administration by the Quebec Government, and it is therefore necessary to appoint a special committee that the work may be directed in an efficient and acceptable manner. The need of housing being pressing, and the building season approaching rapidly the thinking men of Montreal are already interesting themselves in the new proposal.

Still Kicking

—Sykes in "Philadelphia Public Ledger"

Business Men to Act

Chairman Decary had invited a representative committee to confer with him on this matter. This was done that the ideas of others might be secured and that the plans tentatively held by the Civic Commission might be placed before these citizens from various business interests within the city. Members of the Board of Trade were present from the Chambre de Commerce, Builders' Association, City Improvement League, Fabian Society, and the Trades and Labor Council. Some fifty or more attended.

BRITISH SCHEME FOR INDUSTRIAL RESEARCH

Great Britain is making vigorous efforts to hold her own in commerce. No stone is being left unturned to assure her a leading place in trade and industry. The British Advisory Council for Scientific and Industrial Research has established a fund of £1,000,000 to encourage industries to carry on scientific research. Naturally "much will depend on how this money is spent." It has been recognized that the war has made it essential that assistance should be given manufacturers in this important work. The Council points out that it is desirable to "avoid chaining the manufacturer to the routine of Government administration, however efficient." After much consultation and deliberation, the Research Department has recommended that the new fund should be expended on a co-operative basis in the form of liberal contributions towards the income raised by voluntary associations of manufacturers established for the purpose of research.

THE WASH ROOM TRAGEDY

They found him in the wash room of
the Pullman sleeping car.
Some thought that he had fallen and
been staggered by the jar;
Some fancied he had fainted, and some
guessed he'd had a stroke.
But the wise ones only chuckled, when
at last the victim spoke:
"I was shaving! I was shaving! Oh,
I can't remember more.
I was shaving, busy shaving, when I
seemed to hit the floor!"

It was early in the morning and the
train was pulling in
When the gentleman decided that he'd
scrape his cheeks and chin;
So, regardless of his neighbor, who
might want to wash his face,
He proceeded very calmly to make use
of all the space.
I can't tell just what happened, for
the room was very small,
And a lot of us were waiting, when
we heard the stranger fall.

On the leather cushions near him stood
his open traveling case
And his personal possessions occupied
each bit of space.
From the hooks his clothing dangled—
he'd monopolized them all;
There were shaving soap and powder
and some stuff we couldn't call—
Quite enough to stock a drug store, on
the wash stand strewn about,
Which is why the wise ones chuckled
when they found him flattened out.

No one seems to know the story, no
one seems to care to tell,
We found him cold and silent in the
wash room where he fell.
There are some who think he fainted,
some who think he had a stroke,
But the wise ones sit and chuckle, and
they treat it as a joke.
For they know that someone landed,
with a wallop swift and straight,
On the hog within the wash room, who
too oft had tempted fate.

—By Edgar A. Guest.

We have all met this chap.

COPPER IN MANITOBA

The copper discoveries of Manitoba are rapidly assuming considerable magnitude. Professor Wallace, Commissioner for Northern Manitoba, states that in one copper mine, as yet undeveloped, 20,000,000 tons of ore, averaging $8,75 a ton in value, have been blocked out. He estimates that, when railway facilities are available, this area will provide employment for 1,100 men for about fifteen years.

The nickel market may come largely under German control. An advertisement in the German papers inserted by an important Stockholm company offers to sell or to co-operate in working, the most extensive and at present best-known deposits of nickel ore in Scandinavia. Large users of nickel are informed that they may not only secure an abundant supply for their own requirements, but in large measure obtain control of the nickel market in the future.

Why My Men Are Loyal

Based on an interview with

FRANK WATERHOUSE

President Frank Waterhouse and Company

Reprinted by courtesy of "System," the Magazine of Business

A list of the businesses which Mr. Waterhouse has organized and controls would be a list of many of the most important undertakings in Seattle and the Northwest. He has had unusual success in creating loyal, profit-making organizations. And in this article are described his methods of handling one problem that he finds common and supremely important in all these organizations — men — the element that can most quickly make or break a business.

SHIPS and men are alike in many ways. I know something about both. Our business is shipping; and one of my principal business tasks is to make sure of the loyalty and ability of our men. Here is an instance of this similarity that exists between ships and men:

Occasionally, a fleet of merchant ships is offered to us for purchase or charter. Invariably we ask:

"What is the average age?"

We are not interested in knowing that two or three of them may be only two years old, if several have seen service of 18 or 20 years, and the average age, say, is 15 years, it is not worth while to investigate such a fleet further. The normal opportunities for profit making with vessels of that age are very poor. But when the average age of the vessels is only 5 years, we might be very much interested, as the cost of operating modern vessels is a great deal less than the cost of operating old vessels. Furthermore, vessels 5 years old have a reasonable expectancy of 15 years of useful service, while vessels 15 years old might have very few years left.

In the same manner we believe in a youthful organization of employees, made up of men in their prime. Youth, as a general thing, is aggressive, ambitious, and physically and mentally able to absorb constantly increasing tasks. Age is usually more ready to shift responsibilities than to assume them. Of course there are many exceptions to this rule, but as between a young man and an old man of equal ability we prefer the younger, because his expectancy of life is greater, his period of probable future usefulness is longer, and the expectancy of life of our business therefore—if made up of young fellows like him—is greater.

Don't mistake me. We do not let men out at the top in order to keep a young organization. When a man comes with us and makes good, he is here for life. We have a number of men and women who have been with us since our business was established in 1898. We do take men in at the bottom. The average age of our executive officers, department managers, and office employees is about 36 years. The fact that many of the men have been with us for a long time is the more noteworthy because we are in a new country. An ideal organization, as I see it, is old in service but young in years.

We have a valued competitor, in whose organization the average age is nearer 56 than 36. Which business, his or mine, do you think has the better chance of survival?

How We Branched Into Various Lines

Age, of course, is but one element in building an organization. Nearly any concern will succeed if the men are right. I say this out of an experience with many apparently diverse lines of business. For as the opportunities of a rapidly growing country presented themselves, we advantaged ourselves of them in various ways. Our ships plying the coast and Alaskan trade made us familiar with the possibilities of bringing Vancouver coal to Seattle. Out of this trade grew the idea of becoming sales agents and producers, and consequently our coal company.

Delivery problems in the coal company suggested the need for motor trucks; and the economies of purchasing from ourselves gave us the idea of becoming sales agents for one or two truck manufacturers. This agency has become one of the largest in the Northwest, handling now both trucks and pleasure cars. In connection with the pleasure cars, we again saw a need this time in local motor transportation, and we capitalized it by establishing a taxicab company, and later, a baggage service.

Our shipping needs suggested opportunities also, and we organized companies to handle the stevedore business, to build and operate docks, to operate tugs, and to underwrite marine insurance. Recently we undertook to build up an iron works, and have started to publish a magazine.

All of these organizations, with the single exception of the iron works, have grown either directly or indirectly out of our shipping activities. And always, as each new unit has been added, the principal problem has been to make sure the men were right.

We have no faith in patented plans for picking loyalty and skill. We have tremendous faith in the ability of management, by right methods, to bring out surprising skill, plus loyalty, even in men and women of only moderate ability.

It is a human problem, which no mere set of rules can cover. But perhaps we can describe our methods best by summing them up briefly and then explaining our thought in detail. Not as hard-and-fast rules, therefore, but merely as a way of phrasing certain principles that are fundamental in building an organization, I believe that a high average of loyalty and skill can be attained only if you:

1. Understand your employees—know them at first hand;

2. Let them as well as the management share fairly in what the business earns;

3. Keep the organization young—the average age low—fill gaps in the ranks at the bottom instead of at the top;

4. Give every man a job, and let him run it—judge him by results, not by his personal methods of working.

Misunderstanding, to start with the first of these principles, is the original basis of enmity, and the cause, I venture to say, of 99 per cent. of all the troubles that arise between employers and employees. It is easy to avoid—but few of us avoid it. The remedy is simple: meet the man with whom you disagree and talk out your apparent differences of opinion in common terms and on a common basis. Often the differences, defined in that way, vanish completely.

I am frank to say that five years ago it never occurred to us that it might be wise to go down to our docks in Seattle and talk with the laborers. We took little or no interest if they and their families were sick, or went without proper food and clothes, or were suffering in their homes from lack of coal, or could not meet the rent, or were just barely able to get along on wages they earned working for us. Since we have learned to take a human interest in these problems we have had more happiness, and greater prosperity.

Nothing gives me greater satisfaction and happiness than the kind of harmonious relations that exist between our employees and myself. We are one big family working together for the mutual benefit.

The other day I was talking with a labor leader who anticipated a strike vote in his union. Some of the men of the union were employed in our iron works.

"How about this, Frank?" he asked.

"Of course, we can't afford to injure you."

"No, you can't hurt your friends," I said.

That puts it in a nutshell. And the proposition works both ways. If the men and the management are friends, the men cannot injure the management—and the management cannot injure the men.

How Shall Labor and Employers Come to a Mutual Understanding?

Business is rapidly changing. Traditions vanish overnight. Old ideas about the relations between employers and employees are being examined and revised in the light of new conditions. We work on the basis that snobbishness, class consciousness, the whole chain of evils and artificial barriers to business success, must be swept away.

Every business man, of course, works out the problem in his own way. Our way is to know the men first hand. I am willing to let bank presidents cool their heels in my anteroom occasionally if necessary. But my door is always open to labor leaders We had a striking demonstration recently of the tremendous progress that can be made when men of divergent opinions sit down together and thresh out their differences.

Our immediate cause of trouble was the decision of the federal board charged with regulating the wages of workers on Government war contracts. The men had been led to suppose that the board would adjust wages to correspond virtually with the increase in the cost of living. The actual award—when it was announced—fell considerably short of their expectations.

The men immediately began to agitate a strike. And to cap the difficulty, word came from Washington that if the business men permitted the strike to take place, contracts aggregating hundreds of millions of dollars would be canceled instantly without further notice.

We laid these facts before the men. For our mutual interests we urged the formation of an informal arbitration board to discuss our common problems. We invited the men to submit the names of seven of their leaders for the approval of the business men. And we in turn proposed seven business men who were to be approved by the unions. These fourteen when chosen were to confer on the selection of a chairman.

I was chosen one of the members. When this committee first met, we were two antagonistic classes—capital sitting gloomily on one side of the table, labor on the other. Then we began to talk—to understand one another's problems—to see that we were considering not merely class benefits, but the welfare and interest of the entire community of which we are integral parts.

After but a few meetings there was no more ranging of sides. Men sat beside one another, regardless of whether they represented capital or labor. Dozens of delicate problems virtually solved themselves. All our cards were laid face up on the table. The original cause of class hatred—misunderstanding on both sides—was banished.

Although it has had a most beneficial effect in bringing employers and employees together, it is too soon to predict how successful its work will be. I believe, however, it is a move in the right direction, and that the best way to overcome labor difficulties is to become better acquainted with laboring men and to give them practical help with the many serious problems they have to face.

It is not always easy to take the point of view necessary for complete understanding. Often in the past we have been, perhaps unwittingly, unfair to employees by trying to grind the last cent. of profit out of their labor. Unfairness has undoubtedly been directly to blame for the forming of unions, which we sometimes denounce. This or that important business man has said to me in effect: "I would rather pay my general manager $50,000 a year than $10,000—$250,000 than $50,000—if I could find the man who was actually worth it."

Why?

Because the $250,000 man would grind out more profit for the company, perhaps from the men. This, I believe, is an unfair division; too much thought given to the managers, too little to the men. And it is my experience that there are tremendous possibilities in loyal, skilled men.

So I have felt in my business that we owe it to them to change our attitude. They, through their unions, and business through the changes that are rapidly taking place, will force us to change our attitude in any case. But if that were not true, we owe it to ourselves, as a matter of discarding a wasteful business practice, to substitute for our old troubles a good sound basis of mutual understanding.

Just now our labor situation is much disturbed. In the past, with one or two exceptions, we have gotten along well with the labor unions. I number among my best friends some of the principal labor leaders in the North-west, and it is difficult to quarrel with your friends. We of course believe in the right of both the employers and the employees to organize for protective purposes, and to bargain collectively. We believe it is our duty to uphold, in every way we can, the hands of conservative labor leaders.

I have found that the path of the conscientious labor leader, contrary to general opinion, is anything but an easy one. He should be helped in the fair performance of his duties by the employer. It seems sure that the working classes of all nations will organize for protective purposes under some banner or other. It surely is in the interest of all concerned that this organization shall be effected by membership in such bodies as the American Federation of Labor and their affiliated unions.

Directly out of this thought arises the second general consideration which I have already mentioned: namely, to let the employees, as well as the management, share fairly in what the business earns.

One Way to Lessen Labor Turnover

I am not by nature a philanthropist given to impractical schemes. The purpose of my organizations is to earn profits. And they have nearly all been at least moderately successful. My point is that the best way to increase profits, so far as the employees can help, is not to buy their financial worries as well as their services, through paying insufficient wages. There are tremendous possibilities for greatly increased profits through increased loyalty and skill alone.

Money alone will not buy loyalty. But you are not likely to have it in full measure without money.

We pay the highest wages or a little better, as a fixed policy. And we do more. We divide our profits in a fair manner with our employees. Every employee who has been with us over twelve months is entitled to participate in the profits. We distribute our profit payments to our employees twice yearly. While we have paid larger sums in the last few years than many concerns might find it possible to do, owing to unusual business conditions, yet we feel that if the employee, even one in a minor position, returns to us complete loyalty

ONE WAY TO WORK WITH MEN

A CAPTAIN who takes out a ship cannot wait on instructions from the owner if anything goes wrong at sea. He is the sole authority, charged with but one task—bringing his ship safely to port. So in business after a task has been assigned, there is but one thing in which we are interested—results. You can never tell what a man is capable of doing, what initiative or executive ability he will develop, until you give him the opportunity, and until you place the entire responsibility for the result of the work on him. It is a fact that if you share responsibility, the other man holds you partly to blame if there should happen to be any failure to come up to expectations.

and full service, he is worth above the market rate of wages, in our opinion, and we are glad to pay it as a matter of good business, and to make sure that the men are right.

Why, you may ask, do we pay a bonus that amounts to a great increase in the salary? I figured, simply, that it is just. Our employees are in the main responsible for large profits. They should share in what they help to create.

I have proved to my satisfaction that the bonus pays us well, mainly through the increased loyalty and pleasure our employees take in doing their work in the best way. At certain periods, for instance, we require hard and long-continued work. We scarcely know what it means to ask any one to work overtime. Every man and woman knows what his or her job is and stays until it is done. If needs be, the lights will commonly burn in our offices till midnight.

Besides, there is practically no labor turnover. People insist on staying with the company. Our experienced men seldom quit us. One of our girls was not as competent as we required. It was a question of reducing her salary or letting her go. We did the former, hoping she would quit.

"I think I'll stay," was her rejoinder "I can learn to do my work better."

Contented, loyal employees, without financial worries, naturally work a lot better than those in the background of whose minds are recurring thoughts of unpaid bills. Thoughts in business hours should be devoted to the job in hand.

When the war broke out we decided to encourage our boys to enlist in the service of this country or any of our allies. We agreed, during the period of their service, to pay them the wages they were receiving from us less the pay they received for their military or naval service, and to give them back their positions when they returned. The agreement has been carried out. Many of the boys enlisted. Several distinguished themselves and are now returning home with the happy assurance that a hearty welcome and the positions they left await them.

I insist on the point that if any man is in trouble of any kind, financial or otherwise, and goes to anybody except the boss for help, he is severely reprimanded. I consider it good business, not a waste of time, to attend to affairs outside the range of business that affect the interests of employees, when I can be of service.

Recently one of my executives was away on business. His draft questionnaire came to the house, and his wife, considering it of immediate importance, telephoned me to know what she should do. The questionnaire was not due to be returned for several days, but I had our company attorney go to the draft board and explain the circumstances. And I called the wife later to assure her that she need not worry.

It was a trifling service. But many misunderstandings arise from overlooking trifling affairs.

In addition to the salaries and bonus, my department heads all own stock and have a direct interest in profits. Every employee can hope to become a department head and stock owner, for, as I have explained, it is our fixed policy to fill the gaps in our organization from the bottom.

Some Rules We Follow With Our Executives

The considerations that prompt these financial arrangements with employees are primarily the considerations of good business and better profits. And there is a deeper consideration, not inconsistent with these. I put it last because it is perhaps a social thought even more than a business thought. But in my opinion no business man should fail to consider his social responsibilities.

The consideration is this:

I do not have to carry the burden of feeling that members of my family dress in furs, travel at will, take advantage of the best schools, or ride in luxurious limousines on profits earned from the labor of underpaid men and women. I feel that any man placed in charge of large affairs owes a duty, in return for the superior advantages accorded him, to the workers with whom he is associated.

The third general principle—keep the organization young, and fill gaps in the ranks at the bottom—I have already discussed. I feel that the importance of this policy should not be overlooked.

Rarely, and only for special purposes, do we take ready-made executives from the outside. We start our people at the bottom, and they learn our business thoroughly before they have the direction of affairs in their own hands.

Finally we let them run their own jobs. A captain who takes out a ship cannot wait on instructions from the owner if anything goes wrong at sea. He is the sole authority, charged with but one task—bringing his ship safely to port. So in business after a task has been assigned, there is but one thing in which we are interested—results. You can never tell what a man is capable of doing, what initiative or executive ability he will develop until you give him the opportunity, and until you place the entire responsibility for the result of the work on him. It is a fact that if you share responsibility the other man holds you partly to blame if there should happen to be any failure to come up to expectations.

"The balance sheet and the income statement are my tests of an executive's ability. We set a task—what we think can and should be accomplished. The man in charge handles the job in his own way, as long as the result is attained. He need not come to me at all unless he wants my advice. If the results are right, my hands are off. A serious and continued failure to attain the desired results of course calls for a reckoning, in which case there can be no clouds on the record.

"This is the easiest way I know of for me to handle my work, in the course of which I have many things to do besides attend to the details of operations. And the results are most satisfactory.

What are the Tests of Executive Ability?

"I cannot conceive of greater harmony prevailing in any business organization than in ours: where all our interests are mutual and the relations between employer and employee are based on sincere friendship and regard. Our business has principally succeeded through the loyalty and friendship which exists and has existed between our company and its employees; because of the low average age of our staff; because they started in with us when they commenced business life and for the most part have remained with us to the present time; because they are happy and contented and would not change their positions if an opportunity to do so presented itself; because we leave the working out of their jobs to them, judging the work solely by the result."

England Will Favor Colonies in Buying

May Be Revision of Tariff Upward, But Preference Likely For Colonies—Changes Will Be Made in Former Methods—Overseas Trade May Be Gone After Vigorously —Will Intensify Effort at Home

Interview by "Sanitary Engineer" representative with E. C. Townsend, 2nd vice-president and manager Crane, Limited

THAT there may be a revision of the tariff upward in England is thought possible by E. C. Townsend, 2nd vice-president and manager for Crane Limited, Montreal, Quebec. Mr. Townsend returned recently from a trip of several weeks to that country, and his observations lead him to feel that, when the tariff is changed, due and real consideration of a favorable nature will be given the Colonies, and that such preferential consideration will be afforded as the situation demands. He thinks that there will be no doubt of the wish to buy, in Canada, as well as in the other colonies, such goods as may have to be purchased abroad.

Will Seek Trade Too

Asked as to whether there was a likelihood of the British manufacturer seeking business abroad in various lines of manufacture such as porcelain ware, enamel ware, etc., Mr. Townsend believed that there would be a bid for this business. In many ways the British manufacturer had a good line of goods, and these would be pushed abroad. Just whether the conditions at this time will permit of foreign markets being greatly

(Continued on page 47)

Many New Bills Affect Retailers

Legislation Now Under Consideration at Ottawa Will Have Important Bearing on Merchandising in All Its Branches—Aim is to Make For Better Conditions in Business Generally

By T. M. FRASER, Ottawa Representative of the MacLean Publications.

EVERY year a large amount of legislation, or proposed legislation, comes before Parliament or its committee, of more or less importance to the retail trade, and this year is no exception to the rule. E. M. Trowern, the Dominion Secretary of the Retail Merchants' Association, always keeps a watchful eye upon the bills going through Parliament, and usually has a number to steer through himself; and whether he is promoting legislation or preventing it, it is all with the idea of forwarding the interests of the retailers.

SANITARY ENGINEER in a recent issue gave an account of the meeting of the Dominion Executive of the retailers, and referred to several matters which it was proposed that the Government should deal with in one way or another. In the issue of March 29, a full account was given of the proposed Bankruptcy Act, now before a committee of the House.

Legislation Needed

The following is the full agenda prepared to lay before the members of the Commons and Senate, as subjects requiring legislation: Bankruptcy Act; Requiring Merchants to Keep Books; Sale of Articles Left for Repair; Amendments to the False Advertising Act; Carrying of Parcels and Catalogs by Mail; Fire Insurance Act; Weights and Measures; Price Maintenance Legislation; Fixing of weight of contents of Cereal Packages; Adulteration Act; Inland Trade Commission; Government Employees to Come under Garnishee Act; War Stamps on Patent Medicines; War Profit Tax on Luxuries; Purchasing of Goods on Sabbath; Daylight Saving; Customs Confiscating Automobiles; Co-operative Societies.

Now Being Considered

A number of other items enumerated have been dealt with in one form or another. The requiring of merchants to keep books, amendments to the False Advertising Act, and Price Maintenance are now all before the Department of Justice for consideration. The sale of articles left for repairs has been dropped for the present. The carrying of parcels and catalogs by mail is being dealt with by a special committee. The Adulteration Act is before the Cabinet. Nothing will be done on the Inland Trade Commission this year. A bill will be introduced to deal with the matter of the weight of contents of cereal packages; and it may be noted that the weight of contents of salmon and lobsters and other canned goods has been discussed before the House at some length and legislation regarding it will likely be introduced.

Matters of Policy

There are several matters, such as co-operative societies and the confiscation of automobiles carrying liquor, which are a matter of policy and cannot be dealt with by legislation, but strong representation regarding them has been made to the Government and some action will likely be taken.

The Senate has now before it a bill entitled an Act to Amend the Criminal Code, respecting prevention of fire. This provides that everyone is guilty of an indictable offence who negligently causes fire resulting in the loss of life or property, or who refuses to make alterations, remove materials or supply apparatus when ordered to do so by the proper authorities.

A bill now before the House deals with the weight of contents of canned goods, referred to above. It provides that there shall be four sizes of cans for lobsters, containing not less than three, six, nine or twelve ounces avoirdupois respectively of dry lobster meat. No other size of can shall be used for lobsters without permission of the Minister. Such permission shall state the minimum amount of dry lobster meat packed in each size of can so authorized.

The Minister of Trade and Commerce has a resolution before the Committee of the House to amend the Fertilizers Act in several respects. The phosphoric acid contents in the guaranteed analysis of a fertilizer must be plainly stated in connection with each package sold. The vendor must affix stamps to the value of one cent for the value of each one hundred pounds sold, with other provisions regarding analysis.

A very lengthy bill regarding Canadian copyright is also before the Senate, and is being both urged and opposed by rival interests.

Dr. Sheard M P., has introduced a bill to incorporate the Wholesale Grocers' Association, which is now before the Committee.

One of the most important matters of legislation to the retailer is that dealing with the war tax stamp duty on patent medicines and articles in bottles and packages, on which an article by Mr. E. M. Trowern will be found on page 46.

Pressing Problems

The Government has got some other problems on its hands that are pressing for settlement, and on which action is being taken. There is the demand of the postal employees for more wages, and various threats as to what is going to happen if this is not attended to immediately. This is a problem that involves the whole commercial world, and those who had a taste of the delays that followed the trouble in Toronto last year when the men went out learned just how much inconvenience and loss it meant. In Montreal 1,200 employees of the Montreal Light, Heat and Power Co., Ltd., are on strike. It is understood that the main points at issue are the refusal of the company to recognize the union and wage differences. The settlement of this trouble is perhaps more important than appears on the surface owing to the number of firms dependent upon the power company for power.

Express Men, Too

In addition to these troubles the Canadian Express Employees have refused the award of the Labor Board and are expected to walk out. Some twelve hundred men are affected, and this may prove a more or less serious handicap at a season when business is increasing and express shipments growing larger from day to day, just before the Easter season. The recommendations of the Labor Board, although granting some concessions and increasing pay schedules, were not acceptable to the men.

PRACTICAL SHEET METAL WORK

(Continued from page 28)

a roof flange for pipe that is projecting through roof at the ridge. It will be noted that the patterns are identical. The same course is followed in spite of the fact that the elevation is somewhat different. The plan is the same, but the elevation differs, in that the centre of the flange at A B is turned down 90 degrees instead of being extended upward in the same direction.

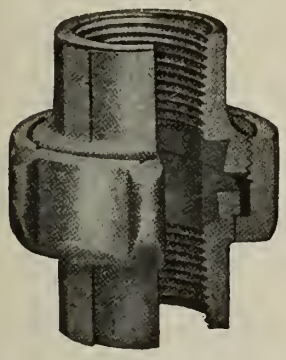
If the dotted lines are noted, it will be seen that an outline can be observed. If the reader will look over the various plates already published and carefully note how similar some of the patterns appear, he will be able to adapt many of them for purposes other than what the patterns were originally made for.

(Continued in next issue.)

New Goods Department

ROCKWOOD UNION

The R. Bigley Co., of Toronto, Ontario, has secured an agency to handle the new Rockwood pressed steel union, which is manufactured by the Rockwood Sprinkler Co., of Worcester, Mass. The new union, it is claimed, is tested to a



pressure exceeding 1,000 pounds and is fully guaranteed as suitable for use on lines containing super-heated steam at high pressure, ammonia, or hot gases. It is manufactured of the best quality pressed steel and is cold drawn. It is guaranteed free of sand or blow holes and to be stronger than a cast union. It is seamless and is protected from rust by a special coating. The union has two bronze seats, both ground to a ball joint, and is claimed to expand and contract equally with the pipe on which it is used, so eliminating leaks at the threads.

FUEL SAVER AND HEAT INTENSIFIER

The Thermos fuel saver and heat intensifier, now offered to the trade by the Heating Specialty Co., 505 Queen St. W., Toronto, will, it is claimed, save from 25 per cent. to 75 per cent. of the fuel bills.

It is manufactured of heavy galvanized iron, and, it is claimed, can be installed on any stove, range, furnace or boiler.

The saving is accomplished, it is said, by the retention of the combustible gases in the fire chamber, thus confining the heat in the furnace or boiler, thereby creating a hotter circulation of air or water.

It is further claimed that the smoke pipe remains comparatively cold, while an intense heat circulates through the register pipes or radiators.

NEW LIGHTING PLANT

The Matthews Engineering Co., of Sandusky, Ohio, have added to their line of Full Automatic Lighting Plants, which heretofore has consisted of 1, 2, 5 and 15 kilowatt plants, a new size known as their "Little Husky." It carries a 300 watt continuous rating on the generator. The makers state that this plant is made in the 32 volt type, same as their 1 K. W. plant, their argument being that even for so small a plant as this the limitations of a lower voltage make it most undesirable for the practical applications that a 15 light will obtain, This plant is the simplest possible kind of a direct connection of a generator to an engine. The plant is full automatic like all Matthews plants—starts itself when the battery needs charging and stops automatically when battery is charged.

The generator frame and engine crank case are integral. The engine is a 4 cycle, water cooled type, 2 in. bore, 3 in. stroks. The plant is guaranteed to have 35 per cent. overload capacity. A 60 ampere hour Willard glass cell storage battery is used with the plant.

ENGLAND WILL FAVOR COLONIES IN HER BUYING

Continued from page 45

England will favor Colonies in her Buying,....2 Col. Head.

developed is not altogether clear just now, but the difficulties have been and will be overcome. The British manufacturer is a different man, since the war started, and is unquestionably going to be a factor in world trade.

"It is very likely that the Consular agents of Great Britain in various parts of the world will be very much better informed than they were before the war," said Mr. Townsend. "The German agent was able to steal a march on him because he had a world of information at his command when an enquiry came in. "Now, I think, the British Consul abroad will be a different class of man. He will very likely be well informed as relating to the many products that are made at home. He will have a lot of tabulated information which will interest the prospective buyer. This he did not possess before, and very often he could not do more than give out the names of manufacturers of a given line, I would not be surprised if he will now be given a regular course of training to qualify him for this work."

Changes in England

While Mr. Townsend's visit was necessarily brief, he had opportunity to sense some of the conditions there. Manufacturers appear to be optimistic. They are maturing various plans that should enable them to carry out more speedy work than ever before. Generally, in a great many cases, the Englishman has not been as aggressive as he might,—not nearly as aggressive as many of his competitors. Always a gentleman, he has not realized the stern necessity of meeting competition, but he has changed his mind and his policy from this time forward, Mr. Townsend thinks, is to be one of sound, sane aggression.

There has always been a quiet and ready acquiescence to the foreign manufacturer in many ways, and in the steel industry manufacturers in Germany and other countries have been fast digging into the world trade for these lines at the expense of the English producer. This, Mr. Townsend feels, will now be more vigorously combated, and the production of many lines, will, in time, be much greater than it is now, and greater than it was before the war.

In the matter of intensifying business at home, the manufacturer will be more modern. He will realize that the home consumption is a thing possible of cultivation. Already, Mr. Townsend pointed out, there is a well-defined desire for better fixtures and more of them. "There are many places in which fixtures have been lacking almost altogether," said Mr. Townsend, "and it is likely that much new work will be installed in these places. This will probably be in homes as well as in factories and industrial plants."

Business to Improve

Regarding conditions in Canada, and the general tendencies for a renewed business activity, Mr. Townsend is confident. "Already contracts are being figured on, and these are for real work that is seriously planned. I think that there will still be care in buying, such as there has been in the past. Prices have been reduced from 12½ per cent. to 20 per cent. on some lines of valves and fittings and there will be a fair amount of work undertaken, I believe," concluded Mr. Townsend.

GENERAL MARKET REPORT

Continued from page 50

Lead Weak; Tin, Copper Are Firm

INGOT METALS.—Lead is down ¼c per pound, but other metals show little change during the week. Copper is holding steadily and the tin market has a fairly firm undertone. Antimony is without particular feature.

COPPER.—A very fair amount of business is being handled and position of the metal generally is much better. Prices are unchanged, but firmly held at 18c to 20c per pound.

TIN.—The market is steady and prices well maintained. Some business is coming to hand and stocks are reported pretty small. Locally the price ranges around 60c per pound.

ALUMINUM. — Interest is lacking, commercial factors still holding out of the market for any large quantities. A nominal figure of 50c per pound prevails, but this would probably be shaded very substantially for any actual business.

ANTIMONY.—Dullness marks the attitude of this metal. Price holds without change at around 8c per pound.

TO BUILD $1,000,000 PLANT

Erection of machine and assembling plants, at a cost approximating one million dollars, will take place at Walkerville, Ont., within the next few months, according to an official of the Maxwell Motor Co. The Walkerville subsidiary will be used as the distributing centre for the British Empire and for a large part of other export trade also.

Market Conditions and Tendencies

STATEMENTS REGARDING SUPPLIES AND TREND OF PRICES

THE MARKETS AT A GLANCE

LOWER prices have again been reached in many lines related to the steel and iron industries. One of the most important changes recorded is that on wrought pipe. The actual decline in this instance is not great, three to four per cent., but it is traceable to change in basic materials.

Another kindred product which has been revised downward this week is boiler tubes, the present scale of quotations being about 10 per cent. below figures formerly in effect. The belief is expressed that the bottom has been reached on these and that present basis may be expected to rule for some months. Figures today are appreciably below war levels, but still substantially above the pre-war basis.

Jobbers in many instances express and are showing a desire to get prices down to rock-bottom in line with changes in mill costs. This is further revealed in another decline this week in black steel sheets. It is felt buyers can safely come into the market for their requirements now and present scale of quotations should create a better feeling among probable purchasers.

Wrought nipples and couplings, along with malleable and cast iron pipe fittings, have undergone a slight revision downward. A change in brass goods has also been effected, compression lines along with valves and kindred lines registering declines of around 5 per cent.

The situation in enamelware is unchanged, though some interests feel that lower levels may develop as a result of drops in basic materials. Manufacturers point out that they did not follow the rapid advances of the markets on the other side of the line and that lower prices named there are just now getting in line with what market has been here. Closets have declined $1.50 each, both enamel and vitro lines being affected.

Lead pipe and lead waste pape are easier, the decline amounting to ½c per pound. Lead traps and bends have also come down, the decline amounting to 15 per cent. The present discount from list is more in line with the substantial declines made in the metal during the last three months.

The metal markets are fairly well maintained, copper and tin showing a firm undertone

TORONTO, April 12. — Markets show many revisions this week and the tendency all along the line is towards lower levels. Wrought pipe, wrought nipples, malleable and cast fittings are affected, and a general change in brass goods, including compression bibbs, valves, etc., has taken place. Boiler tubes are down about 10 per cent. and black steel sheets are also lower. Lead pipe and lead waste pipe along with lead traps and bends have declined.

Range Boilers Show No Change

RANGE BOILERS. — New developments are lacking in these. Prices remain at figures recently named, but there is only a fair amount of strength to the tone of the market. Business is still within rather a narrow compass.

Range Boilers	Standard	Extra Heavy
30-gallon	$12 25	$14 50
35-gallon	15 00	17 00
40-gallon	18 00	20 00
52-gallon	24 00	28 00
66-gallon	33 00	38 00
82-gallon	40 00	47 00
100-gallon	50 00	58 00

Closet Tanks and Seats Down $1.50

ENAMELWARE.—Prices on closet tanks and seats are down $1.50 each in new prices just issued to the trade. With oak tank and peat present quotation is $25.50 and enamel iron or white vitro tank is quoted at $27.50. Other lines show no revision, but some in the trade look for prices to recede somewhat following the declines made in many basic materials.

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Basins, flat back, 14 x 15 in.	6 00
Do., corner, 15 in.	5 95
Sinks, roll rim, 18 x 30 in.	15 05
Sinks, flat rim, 20 x 30	6 47 6 35
Do., 18 x 30	5 62 5 50
Do., 18 x 24	5 12 5 00
Do., 16 x 24	4 92 4 80
Do., 14 x 20	4 25 ....
Closets, oak tank and seat	25 50
Do., enamel iron or white vitro tank	27 50

Pipe Fittings Revised Downward

SOIL PIPE FITTINGS.—Pipe fittings are again under revision downward this week, as will be noted in discounts named below. Wrought nipples and couplings, after remaining steady for some months, are on the downward move.

Soil pipe and soil pipe fittings hold at changes recorded in last issue. There is some business offerings, but this is not a heavy volume as yet. Discounts now in effect are shown herewith:

SOIL PIPE AND FITTINGS

Medium and extra heavy soil pipe, 2 in. to 6 in.	20%
Medium and extra heavy soil pipe, 8 in.	25%
Medium and extra heavy fittings, 2 in. to 6 in.	35%
8 in. soil pipe and fittings	15%

C. I. PIPE FITTINGS

Cast iron fittings	20%
Plugs	35%
Bushings	35%
Unions, standard	50%
Dart unions, ¼-inch to 2-inch	25%
Do., 2½-inch and larger	15%
Nipples, up to 4-inch	60%
Do., 4½-inch and larger	50%
Do., running thread 4-in. and under	30%
Couplings, 4-in. and under	40%
Do., 4½-in. and larger	20%

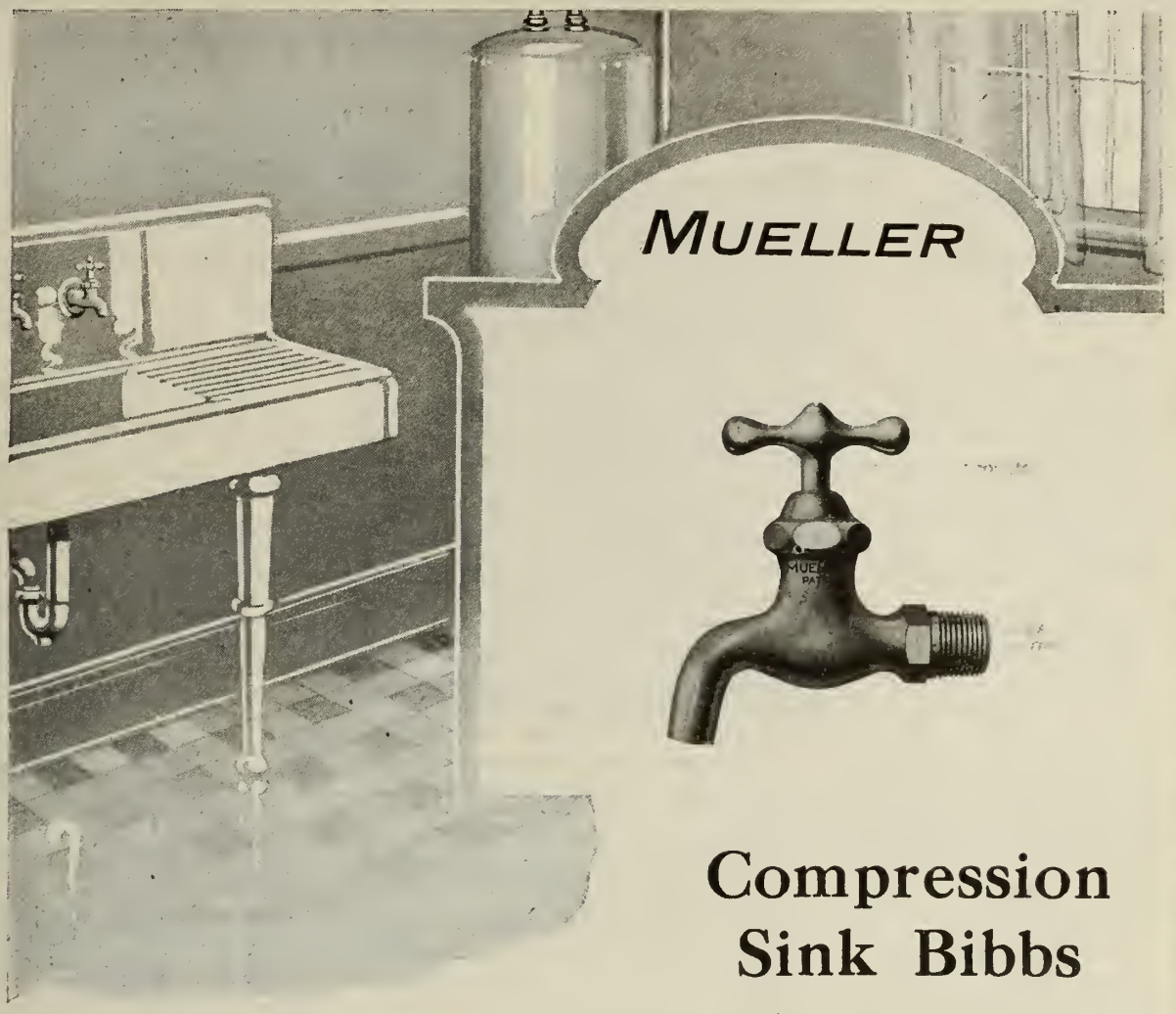
MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittings, Class A, lb.	$0 50	$0 60
Do., Class B, lb. net	0 21	0 30
Do., Class C, lb. net	0 14	0 21

Brass Goods Register Declines

VALVES.—Brass goods have undergone a general revision downward amounting to about 5 per cent., and in some instances slightly more. Practically the entire list is affected, the new discounts now ruling being shown below. Some very good business is being handled and a better feeling in respect to trade is expressed.

	Discount off list
Compression work, standard	50
High grade	49



MUELLER

Compression Sink Bibbs

SIMPLE elegance, combined with superior strength and wearing quality, is what you give your customer when you install **MUELLER** goods.

The many advantageous features of **MUELLER** compression bibbs give maximum service from the bibb as a whole. The anti-spreading device that breaks up the whirling motion of the water and the corrugated stem and handle, allowing the handle to be set at any angle without becoming loose or wobbly, are only two of these features.

MUELLER Bibbs are the best the market affords. Write for prices.

H. Mueller Mfg. Co., Limited

SARNIA CANADA

MUELLER

Fuller work, standard	45
High grade	38
Basin cocks, No. 0 standard	40
Nos. 1 and 2	40
Bath cocks, compression	50
Bath cocks, Fuller	45
Flatway stop and waste cocks, standard.	50
High grade	47
Roundway stop and waste cocks, standard	50
High grade	47
Brass steam cocks, standard, add 10%.	
Globe, angle and check valves, standard.	Net
Do., removable disc	Add 5%
Radiator valves, standard	10
Do., removable disc	Net List
Basin Cocks—	
No. 0 and 1, Fuller pattern	45
Globe, angle and check valves, standard, medium pressure	10
Radiator valves, standard med. pressure.	30
Radiator valves, removable seat, medium pressure	25

Wrought Pipe Prices Announced

WROUGHT PIPE.—In line with information supplied in SANITARY ENGINEER last issue, a decline is noted in new list of prices just issued on wrought pipe. This recession, while only amounting to about 3 per cent., is a natural reflection of the lower basis established on basic materials. The new list of quotations, effective from April 3, is as follows:

WROUGHT PIPE
Price List No. 39, April 3, 1919

Standard Buttweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
⅛ in.	$ 6 00	$ 8 00	$.....	$.....
¼ in.	4 53	6 66	5 13	7 26
⅜ in.	4 53	6 66	5 13	7 26
¾ in.	5 99	7 57	6 84	8 42
½ in.	7 53	9 66	8 68	10 81
1 in.	11 14	14 28	12 84	15 98
1¼ in.	15 07	19 32	17 37	21 62
1½ in.	18 01	23 10	20 76	25 85
2 in.	24 24	31 08	27 94	34 78
2½ in.	38 90	49 73	.....	.....
3 in.	50 87	65 03	.....	.....
3½ in.	64 86	81 88	.....	.....
4 in.	76 85	97 01	.....	.....

Standard Lapweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
2 in.	$ 27 94	$ 34 78	$ 31 64	$ 38 11
2½ in.	40 66	51 48	46 51	57 33
3 in.	53 17	67 32	60 82	74 97
3½ in.	66 70	83 72	75 90	92 92
4 in.	88 00	113 00	107 00	132 00
4½ in.	89 00	113 00	107 00	132 00
5 in.	103 00	132 00	125 00	154 00
6 in.	133 00	171 00	162 00	200 00
7 in.	175 00	224 00	211 00	259 00
8L in.	184 00	235 00	221 00	273 00
8 in.	212 00	271 00	255 00	314 00
9 in.	254 00	324 00	305 00	376 00
10L in.	235 00	301 00	283 00	349 00
10 in.	303 00	387 00	365 00	449 00

Terms, 2% 30 days, approved credit.
Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Cotton Waste Holds; Oakum Unchanged

WASTE, OAKUM. — Cotton waste prices show no revision and the stronger feeling in the cotton markets has served to provide a better undertone to waste figures. Business is still rather limited, but outlook is considered very fair.

Oakum is without any particular feature of interest. There is some business being done and prices remain steady.

	Per 100 lbs.
Best American	$21 00-$22 00
Clipper, spun	21 00
Do., unspun	10 50
Plumbers', spun	10 00- 10 50

10 *Per Cent. Decline in Boiler Tubes*

BOILER TUBES.—Further reductions have been made in boiler tubes this week. The decline averages around 10 per cent. Jobbers report business very good and look for present prices to hold for some months to come. There is no difficulty experienced in getting supplies through as needed.

BOILER TUBES—	Per 100 feet Seamless	Lapweld
1 inch	$25 00	$.....
1¼ inch	29 00	.....
1½ inch	32 00	25 00
1¾ inch	32 00	25 00
2 inch	36 00	26 00
2¼ inch	40 00	27 00
2½ inch	41 00	30 00
3 inch	47 00	35 00
3¼ inch	.....	42 00
3½ inch	57 00	43 00
4 inch	65 00	56 00

Black Sheets Down; Galvanized Stiffen

SHEETS, PLATES. — Further revisions downwards have occurred in black steel sheets this week, jobbers expressing a desire to keep basis right down to rock bottom and in this way lend every encouragement to buyers to keep goods moving. Galvanized sheets show a slightly firmer tendency in change made during the week. Quotations now being made to the trade follow:

BLACK SHEETS—	Per 100 lbs.	
10 gauge	$5 00	$5 50
12 gauge	5 05	5 55
14 gauge	5 10	5 40
16 gauge	5 20	5 45
18-20 gauge	5 80	5 60
22-24 gauge	5 85	5 65
26 gauge	5 90	5 70
28 gauge	6 00	5 80
3-16 inch plate	4 90	6 25
¼-inch boiler plate	4 50	5 80

Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

GALVANIZED SHEETS—		
10¾ oz.	$8 25	$8 50
U.S. 28	7 95	8 20
U.S. 26	7 65	7 90
22 and 24	7 50	7 75
18 and 20	7 35	7 60
16	7 20	7 45
12 and 14	7 10	....

Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

Lead Pipe and Waste Down; Traps, Bends, Too

LEAD AND ZINC PRODUCTS.—Lead pipe at 11½c and lead waste pipe at 12½c per pound both show a decline for the week of ½c per pound. Downward prices on lead traps and bends are also provided for through the change from net list to 15 per cent. discount from list. Solder prices are unchanged. Business is reported both quiet and active with activity generally expected to be the ruling trend in a very short time. Prices prevailing to-day are:

Lead pipe, lb.		$0 11½
Lead waste pipe, lb.		0 12½
Lead traps and bends		10 to 15%
Lead wool, lb.		0 14
Lead sheets, 4 to 6 lbs., sq. ft., in rolls, lb.	0 10¼	0 10½
Cut sheets ½ to ¾c lb. extra and cut sheets to size, 1c lb. extra.		
Solder, guaranteed, lb.	$0 35	0 37
Solder, strictly, lb.	0 33	0 37
Solder, commercial, lb.	0 30	0 36
Solder, wiping, lb.	0 29½	0 32½
Solder, wire, lb.	0 40	0 45½
Zinc sheets, per lb.		0 17

Copper Reveals Signs of Strength

OLD MATERIALS.—There is no evidence that scrap metal prices have started to climb yet, but it is easy to notice that there is a great deal more strength in the market than for some time past. There is a chance that fourth quarter copper may be hard to get. Just now dealers are not quoting or selling on that delivery, and if this should keep up for any length of time it would be certain to drive up the price in the local scrap markets. As it is those who have red brass now are asking more money for it.

In the other classes of metals much the same feeling is apparent. There have been no price changes on at the lists published. But there is a growing and a well defined tendency on the part of the trade to hold material instead of making sales under present circumstances. Although dealers do not care to come out and say so it is one of those situations where it is felt that a great many things may happen on very short notice and one of the happenings is likely to be a strengthening of prices which dealers will have to pay in order to induce holders to part with their material.

Dealers' Buying Prices—	
Tea lead	0 03
Heavy lead pipe	0 04
Pipe scrap	8 00
Stove plate, per ton	10 00
No. 2 busheling	8 00
Yellow brass	0 06
Red brass	0 08½
Light brass	0 05
Scrap zinc	0 05
Heavy copper	0 15
Wrought iron, No. 1, per gr. ton	15 00
No. 1 machinery cast	14 00
Heavy melting steel	9 00

SPELTER—Buyers are showing more interest with a consequent improvement in standing of spelter. This has not resulted in any price change, but sales are better. Quotations are being made at 8¼c to 8½c per pound.

LEAD.—The price has sagged ¼c and is quoted from 7c to 7¼c per pound this week. Business is not very brisk, but there is a reasonable amount of activity noticeable.

BOILERS AND RADIATORS DROP

Another decline has been recorded in boilers and radiators this week. Steam boilers are down 3 points, while the round hot water boilers show no revision. Standard radiation has declined 6 points and wall radiation 8 points. These price changes, it is indicated, are not a result of market conditions, but have been brought about largely through competition. Manufacturers in the States are responsible for starting the price cutting, it is said, and the declines they have instituted are responsible for the steps taken by the Canadian manufacturers to take care of the trade here.

FOR SALE

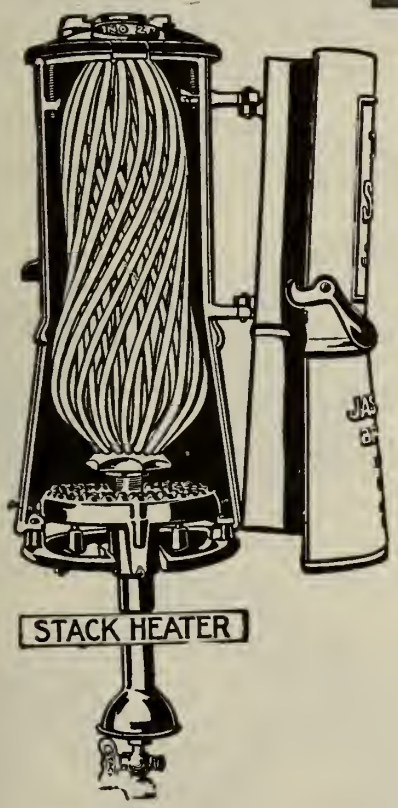
FOR SALE — PLUMBING, HEATING AND electrical business in city of sixteen thousand, established for 15 years. First-class stand. Not a large amount of capital required if security is given. Box 242, Sanitary Engineer.

The "*Morrison*" Cellar Drainer means a Dry Cellar

It works at pressures as low as ten pounds and has all its working parts above water.

The mechanism is simple, which means few repair bills.

It takes up very little room and is easily installed.



Whether for your own use or to sell to your customers it will pay you to investigate the satisfactory, sure and perfect working qualities of the **Morrison Cellar Drainer.**

Dealers are making splendid profits selling them. May we send you complete information?

This is the STACK gas water heater. You will notice at once the small size and large number of the coils which mean quick heat. The sturdy lines on which this heater is built should also appeal to you. For the sake of your reputation you must satisfy your customer. You will be sure of doing so if you sell him the STACK.

TRADE MARK J.M.T. A GUARANTEE OF QUALITY

James Morrison Brass Mfg. Co., Limited
93-97 Adelaide Street West - Toronto

TRADE MARK J.M.T. A GUARANTEE OF QUALITY

The Value of the Business Press to Business Men

"Business men do not realize the value which trade journals and technical magazines may have for them in increasing the efficiency of their factories and in giving them a broad and comprehensive view of their business.

"Our foreign competitors read almost every article published upon their business with great care and thoroughness. Many of them have duplicate copies of their favorite trade paper sent to their homes so that they may read them away from the business without being disturbed. Many foreign manufacturers contribute articles to these journals on phases of the business with which they are most familiar. Such articles are bound to be helpful and have a constructive effect.

"Our trade journals and technical papers are the best in the world, and they should be supported and encouraged by our business men.

"Copies should be placed where employees can see them and they should be urged to read and study them.

"These papers are preaching the gospel of sound business on practical lines and are helpful not only to business but to the country as a whole.

"If the suggestions made by them in the past had been followed by our business men it would not be necessary at this time to point out some of the fundamental weaknesses in American business."

—Edward N. Hurley, formerly Chairman of the Federal Trade Commission, in "The Awakening of Business."

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For Easy Pipe Threading
TRY THE TRIO

Simple — Compact — Complete

3 Dies in 1 Stock

The TRIO uses Little Giant Pipe Dies with the patented double bevel which permits reversing—carries the three sizes you use most frequently. TRIO is fully adjustable.

Always Ready—Always Right

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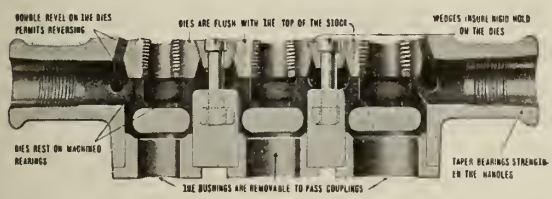
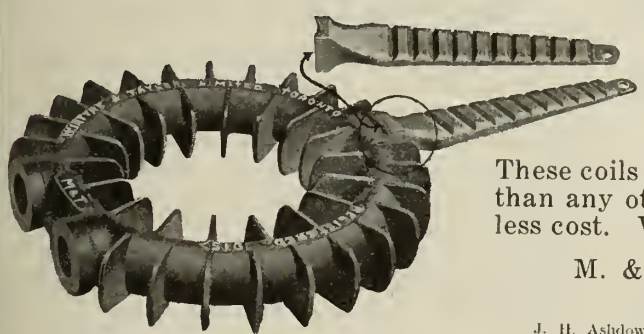

DOUBLE BEVEL ON THE DIES PERMITS REVERSING
DIES ARE FLUSH WITH THE TOP OF THE STOCK
WEDGES INSURE RIGID HOLD ON THE DIES
DIES REST ON MACHINED BEARINGS
TAPER BEARINGS STRENGTHEN THE HANDLES
THE BUSHINGS ARE REMOVABLE TO PASS COUPLINGS

Wells Bros. Company
of Canada, Ltd., Galt, Ontario

Canadian factory of the Greenfield Tap and Die Corporation



M & T
EXTENDED SURFACE
COILS

These coils have a higher efficiency and a greater heating surface than any other make—size for size. That means Hot Water at less cost. We make coils to fit any furnace.

M. & T. Coils may be purchased from these firms:

CALGARY
J. H. Ashdown Hardware Co. Limited.

GUELPH
Taylor-Forbes Co. Ltd.

HAMILTON
Burrow, Stewart & Milne Co. Limited.
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C. Marks & Co.
Standard Sanitary Mfg. Co. Ltd.
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The Empire Mfg. Co. Limited.
The Hobbs Hardware Co. Ltd.

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Dominion Radiator Co. Ltd.
Gurney-Massey Co. Limited.
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Burrow, Stewart & Milne Co. Limited.
Crane Company.
Dominion Radiator Co., Ltd.
Gurney North West Foundry Co. Limited.
Jas. Robertson Co. Limited.
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VANCOUVER
Crane Company.
Gurney Foundry Co. Limited.
Taylor-Forbes Co. Limited.

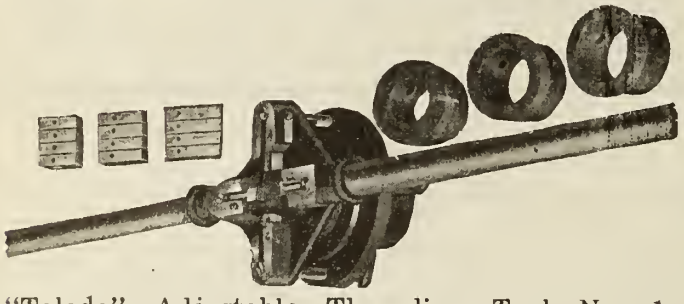
McINTYRE & TAYLOR, Ltd.
TORONTO MONTREAL WINNIPEG

"Jardine" and "Toledo" Pipe-Threading Tools

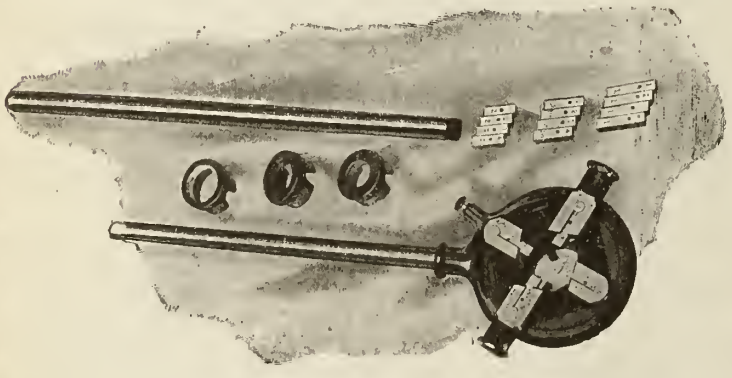
REGISTERED J TRADE MARK

Perfect Threads at One Cut

"JARDINE" or "TOLEDO" Dies cut only with the mouth of the cutter. As the tool advances on the pipe the cutters open out so as to make a proper taper on the thread, the back of the cutters following in thread, do no cutting, they merely steady the tool. The result is perfect threads at one cut.

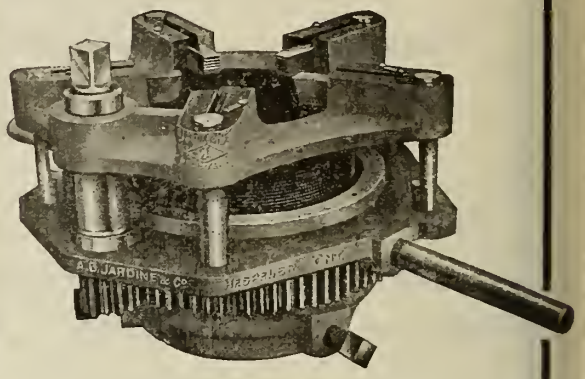


"Toledo" Adjustable Threading Tool No. 1, Capacity 1 to 2 in., inclusive.



"Toledo" Adjustable Ratchet Threading Tool No. 1A, Capacity 1 to 2 in., inclusive.

"Toledo" Geared Adjustable Threading Tool No. 2½. Capacity 2½ to 6 in. inclusive. Weight, 120 lbs.



One Man Does the Work of Two

With the mouth of the cutter doing all the cutting, friction of cutter on pipe is reduced to a minimum. Every ounce of strength exerted is utilized in actually making the thread, which means that the cut is made quicker with much less labor.

No Cams or Jimcracks to Wear and Get Out of Order.

"JARDINE" and "TOLEDO" Tools are built solidly for service. There are no unnecessary gears, nuts, bolts or movable parts to wear, break or be mislaid. There is nothing intricate about their mechanism, nothing but what is readily understandable and easily looked after. Long life and low maintenance cost are outstanding "JARDINE" and "TOLEDO" features.

With a Ratchet They Work in Any Corner

The Ratchet feature of "JARDINE" and "TOLEDO" tools permits of threading being done on pipe actually in place, no matter in how awkward a position. The resultant saving on one or two such jobs often equals the price of the tool.

Order "JARDINE" and "TOLEDO" Tools from your jobber.

A. B. JARDINE & CO., LIMITED, HESPELER, ONT.

Sole makers of "Jardine" Pipe-Threading Tools. Sole licensees to manufacture and sell Toledo Pipe-Threading Tools of Canada.
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INDEX TO ADVERTISERS

A. & J. Mfg. Co. 63
Amherst Foundry Co. ..... Inside Front Cover
Anthes Foundry Co. 1
Beaton & Cadwell 64
Beaton & Corbin 63
Belanger, O., Regd. 64
Borden Canadian Co. 64
Byers, A. M., & Co. 9
Canada Metal Co. 13
Canadian Brass Co. 6
Canadian Consolidated Rubber Co., Ltd. 7
Canadian Tube & Iron Co. 7
Canadian Wolverine Co. 62
Chamberlain Desolvo Co. 61
Consumers Metal Co. 63
Empire Manufacturing Co. ..... Outside Front Cover
Galt Brass Co. ..... Back Cover and 15
Gummer, G. & W. G., Ltd. 8
Hause Mfg. Co., Chas. F. 63
Heating Specialties 10
Hoyt Metal Co. 60
Imperial City Heaters, Ltd. 6
International Malleable Iron Co. 2
Jardine, A. B., & Co. 54
Katie Foundry, The 58
Kerr Eng. Co., Ltd. ..... Inside Front Cover
Lenckel & Plane 1
Lord & Burnham 2
McDougall & Co., R. 62
McIntyre & Taylor, Ltd. 53
Moline Heat 11
Morrison Brass Mfg. Co., Ltd., Jas. 51
Mueller Mfg. Co. 49
Port Hope Sanitary Mfg. Co. 16
Scaife & Sons Co., Wm. B. 60
Standard Sanitary Mfg. Co. 5
Steel & Radiation, Limited 61
Trimont Manufacturing Co. 61
Toronto Hardware Mfg. Co. 60
United Brassfounders & Engineers, Ltd. 57
United Brass & Lead, Limited ..... Inside Back Cover
Wallaceburg Brass & Iron Co. 59
Warden-King, Limited 3
Wells Bros. of Canada 53
Williams, J. H., & Co. 61
X Laboratories 55

CAUTION !

This is a personal message to you. Kindly read every word—you owe it to yourself to do so.

THE thing every steamfitter prizes most highly is his reputation. Without it his standing with his customers—his business—everything is *valueless.*

When a customer calls you in to repair a leaky or cracked boiler you feel it your duty to give him a good job. That's the *only* way to make money. If your judgment tells you it's the kind of job on which to use "X" Liquid—your reputation is at stake if "X" doesn't make good. That is why we take so much care in making "X"—and seeing that it gets to you sealed—branded—and in good condition.

Now, if you should use an imitation of the genuine "X" Liquid, you are not going to get "X" results. Patents on "X" Liquid are allowed—and others are pending. The quality of "X" *can't* be imitated. When this inferior imitation fails to do the work properly, who gets the blame? Who stands the comebacks? Who loses time and money? YOU—*of course.*

So we owe it to our friends to warn them that there is no other product on the market that can do what "X" does. "X" is the ONLY *Scientific* Process of repairing leaky and cracked boilers—and for making them LEAK-PROOF — RUST-PROOF — and SCALE-PROOF.

"X" Liquid is making money for over 24,000 steamfitters. These men will hardly risk their reputations on any unknown, untested product. They'll stick to the genuine "X"—*every time.*

Ninety-nine out of every hundred manufacturers of boilers and radiators use, sell and recommend "X" Liquid. Every good jobber sells it. And the Government uses "X" regularly.

Every can of "X" Liquid carries a guarantee to make 100% good—*or your money back.*

Deliveries are very bad this winter—due to freight conditions. *Keep plenty of "X" on hand for emergencies.*

"X" LABORATORIES

636 Washington Street, Boston, Mass. U.S.A.

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Canadian Powers Regulator Co., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

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Beaton & Corbin Mfg. Co., Southington, Conn.
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Canadian Powers Regulator Co., Toronto.
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Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
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Steel & Radiation, Ltd., Toronto.
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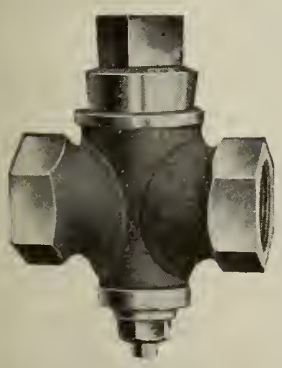
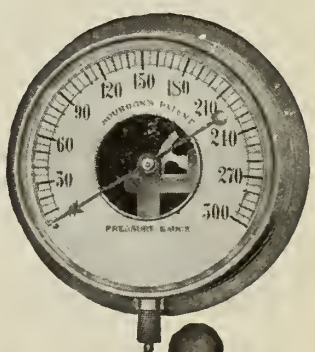


FIVE WORKS---OVER 3,000 EMPLOYEES

UNITED BRASSFOUNDERS AND ENGINEERS, LIMITED

EMPRESS FOUNDRY, CORNBROOK, MANCHESTER, ENG.



DURING THE WAR our Plants have been exclusively engaged on work of supreme national importance.

WITH PEACE IN SIGHT we are pleased to announce that we intend to again direct our energies to the intensive production of:—

GUNMETAL and BRASS VALVES and COCKS.
STEAM, WATER and COMPRESSED AIR FITTINGS GENERALLY.
CAST IRON STOP and SLUICE VALVES.
SEMI-ROTARY PUMPS.
EXTRUDED BRASS and BRONZE BARS.
BRASS BOLTS and NUTS, STUDS and GENERAL TURNED WORK FROM THE BAR.
CAST AND MALLEABLE IRON COCKS and PIPE FITTINGS.
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INJECTORS and GENERAL JET APPLIANCES.
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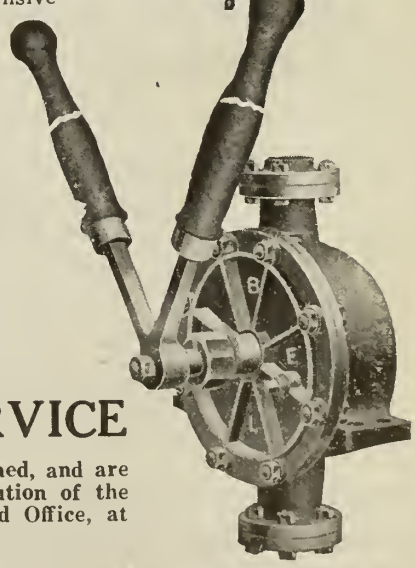
COPPERSMITHS' WORK.
"STELLA" BRAND ALLOYS: MANGANESE COPPER, SILICON COPPER, FERRO ZINC, PHOSPHOR COPPER and TIN, etc.



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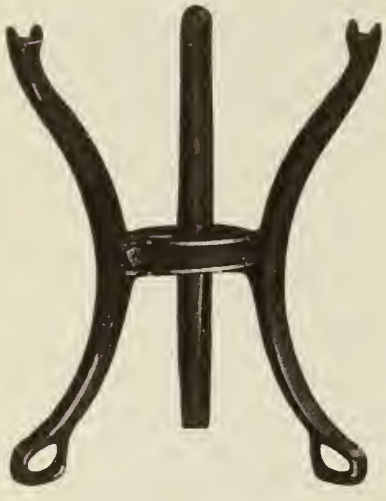
If you are interested in any or all of the lines mentioned, and are in a position to take a hand in the energetic distribution of the same, please communicate with us NOW to our Head Office, at above address.

PLUMBERS
Grey — CASTINGS — Iron

OUR STANDARD

Soil Pipes and Fittings are of pleasing design, and of good finish. They LOOK GOOD and they ARE GOOD.



K-T.—1 Adjustable

OUR SPECIALS

K-T BOILER STAND

Adjustable to 30, 35 and 40-Gallon Boilers

You can make your connection, when you so desire, directly underneath boiler. This saves time. Time is money—**your money.**

Trade K–T IE A Mark

We have another **sometimes time saver,** a

WALL-BRACKET Boiler Stand

This bolts to the wall, and when bathroom space is limited is increases the floor space, and improves the appearance of the job.

Here is a fitting you could have used on that last job. You would have saved some money had you known where to get it. Made in medium or heavy. Right or left. Anything else you need? We make it too.

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THE KATIE FOUNDRY, GALT, ONT.

YOUR JOBBER can supply our goods if you ASK FOR THEM

PIPE AND THE PUBLIC WELFARE

By R. C. McWANE

A Book Just Off the Press

Every sanitary engineer should be the possessor of this book. It deals with pipe-making of all kinds, cast iron, wrought iron, steel, wood and tile pipe. It is valuable because it gives the users of pipe a true idea of how pipe lasts under various conditions when in service.

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A 3200

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If you have used Quaturn you know. But if you haven't, telephone or write one of our offices for one of these Bath Cocks. Look it over. See why it works so easily, yet positively. Why, by closing with the pressure, it's insured against leaks. Why it's economical for you and your customers, as the working parts which wear are renewable. *Then watch your business grow.*

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THE SANITARY ENGINEER, Plumber and Steamfitter of Canada, was established in 1907. The subscribers represent the most progressive members of the sanitary plumbing and heating trade in Canada. The paper is issued twice monthly, on the first and fifteenth of the month. Circulates in all provinces of Canada and also in Newfoundland. There is no waste circulation on SANITARY ENGINEER, because subscribers buy the paper for business. The advertising pages are read closely by the largest buyers of sanitary and heating goods in Canada. These men buy for business as well as for private consumption and therefore represent the best class of readers. When you advertise in the SANITARY ENGINEER you are assured of an attentive audience, who are looking for information about your goods and your method of doing business. Cost of advertising is very moderate indeed. We will gladly supply detailed information regarding rates, circulation, etc.

If interested tear out this page and place with letters to be the SANITARY ENGINEER.

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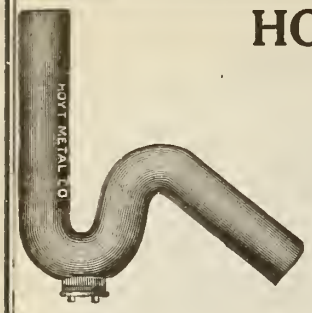
FROM COAST TO COAST



As time-savers there are none equal to our Wiping Solder, Bar or Wire Solder.

Hoyt Lead Traps, bends and waste pipe are in a class by themselves.

All our products are made to formula.

Our Mixed Metal Sales Amount To Over $5,000,000 Annually.

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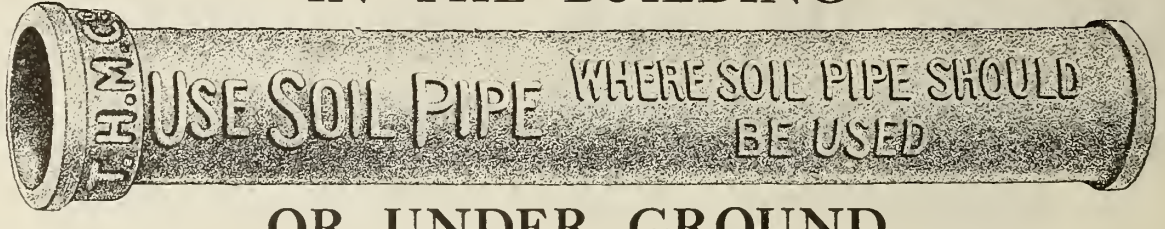

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ASK YOUR JOBBER FOR T.H.M. CO. BRAND OF SOIL PIPE AND FITTINGS.

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WE MANUFACTURE A FULL LINE OF HIGH-GRADE RANGE BOILERS

The K-T FOUNDRY

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K-T

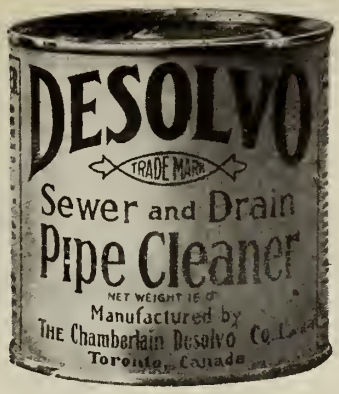
STANDARD

Soil Pipes and Fittings are of pleasing design and good finish. They look good and they **are good**

SPECIALS

Range Boiler Stands are adjustable to 30-35-40 gallon boilers, and you can connect directly under the boiler. Inexpensive but flawless.

Your jobber can supply our goods--if you ask for them



A Better Job--In Less Time

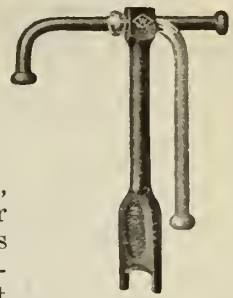
That's what *Desolvo* will do for you. No need to use warm water.

It readily mixes with cold water. Better have a stock on hand for those emergency calls—when waste pipes are clogged. Will save you time and money and complete the work.

Your jobber has it.

The Chamberlain Desolvo Co.
Limited
110 Church St., Toronto
General Offices Pittsburg, Pa.

Williams' Falcon Drop-Forged Waste Plug Spanner



THE old adage tells us, "Necessity is the mother of Invention," but makes no mention of the father; presumably he is "mere man." At any rate, we are rather proud to have "fathered" the invention of the useful and badly needed tool here illustrated.

It is far more efficient than any possible makeshift, and its folding handle allows it to be readily carried in the pocket. The dimensions of the "finger ends" make it universally adaptable to all sizes and forms of basin and sink plugs and grates. The tool is hardened for severe service. Descriptive Booklet on request.

J. H. Williams & Co.
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Agents for Alberta, Saskatchewan, British Columbia and Manitoba

First Cost *versus* Upkeep Cost!

The purchase price means nothing if the upkeep cost is not low.

The purchase price of King Boilers is no more than the average boiler and yet—

The consumption of fuel—*the upkeep cost* is lower—considerably lower.

The thin, peculiarly shaped waterways in the "King" mean quickly heated water and perfect circulation, which causes a saving in fuel because it obviates the necessity of "extra firing" to move cold water from the radiators.

The Trade should use this quick-heating, fuel-saving argument now while fuel is scarce and high in price.

WRITE US FOR PRICES.

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Head Office, FRASER AVENUE, TORONTO
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AGENCIES IN ALL LEADING CITIES

TAP PLUGS

That Work Without Fail

Easy to Operate

Can be applied without shutting off water or draining fixtures.

Three or Six Dozen Assortment

"C" Catalog
"C"

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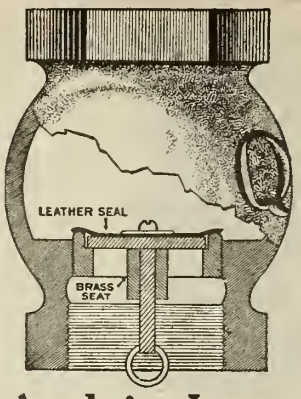

This is a "Q" Foot Valve

And it Just *CAN'T* Leak

There are more pump troubles caused by "leaky" valves than from all the wear and tear which occurs in the average life of a pump.

The "Q" valve will overcome all priming troubles, and water once raised above it, through the suction line, will not leak out.

If you want the pumps you instal to give maximum, you will require to use the only valve on the market that JUST CAN'T LEAK.

Made in sizes from 1 to 8-inch.

R. MACDOUGALL CO., LTD.
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"BC" COMBINATION COLD ROLLED STEEL Floor and Ceiling PLATES

Carried by the leading supply houses No. 15

Puts just the right finish on that heating job

Send for catalog of complete line of "B. & C." goods.

No. 1 Valve

Stock carried by our Canadian Representative
W. H. CUNNINGHAM & CO.
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No. 16

No. 17

The Beaton & Corbin Mfg., Co.
Southington, Conn., U.S.A.
The Old Original Company

"HAUSE" PIPE JOINT CEMENT

For steam, water, air, oil, gas, gaskets, etc. The cement that cements. Sets like gum. Allows no leaks.

The Great Value of "HAUSE PIPE JOINT CEMENT" lies in its peculiar chemical properties which permits of its hardening and expanding after the joints are made up. In making up joints it has the same effect as a lubricant on the best graphite, and while the joints may be made and broken readily, a perfectly tight joint is maintained at all times. Comes in 1-lb., 5-lb., 15-lb., 25-lb., 50-lb. cans, 100-lb. barrels. Manufactured in ready mixed and powder form. Ask your jobber for prices, or write us direct.

Made in Omaha, Neb., U.S.A.

Manufactured in Ready Mixed and Powder Form.

Canadian Distributors:

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SAVE YOUR COUPLINGS

Write us what you have of the various sizes, either in pieces or pounds, and we will make you a cash price on them.

The A. & J. Mfg. Company
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Second-Hand Pipe

1-2" to 4"

Black and Galvanized

Send us list of your requirements

Consumers Metal Company, Limited
14 St. John Street MONTREAL
Works: LACHINE, QUE.

Becoming a Bigger Man

WHAT is the difference between some men you know and others known to you? Why are some men earning $3,000 a year and some $30,000? You can't put it down to heredity or better early opportunities, or even better education. What, then, is the explanation of the stagnation of some men and the elevation and progress of others?

We are reminded of a story. A railroad man, born in Canada, was revisiting his home town on the St. Lawrence River. He wandered up to a group of old-timers who sat in the sun basking in blissful idleness. "Charlie," said one of the old men, "they tell me you are getting $20,000 a year," "Something like that," said Charlie. "Well, all I've got to say, Charlie, is that you're not worth it."

A salary of $20,000 a year to these do-nothing men was incredible. Not one of the group had ever made as much as $2,000 a year, and each man in the company felt that he was a mighty good man.

Charlie had left the old home town when he was a lad. He had got into the mill of bigger things. He developed to be a good man, a better man, the best man for certain work. His specialized education, joined to his own energy and labor sent him up, up, up. To put it in another way: Charlie had always more to sell, and the world wanted his merchandise—brain, skill and ability. Having more to sell all the time, he got more pay all the time.

Charlie could have stayed in the old home town; could have stagnated like others; could have been content with common wages. In short, Charlie could have stayed with the common crowd at the foot of the ladder. But Charlie improved himself and pushed himself, and this type of man the Goddess of Fortune likes to take by the hand and lead onward and upward. Almost any man can climb higher if he really wants to try. None but himself will hold him back. As a matter of fact, the world applauds and helps those who try to climb the ladder that reaches towards the stars.

The bank manager in an obscure branch in a village can get out of that bank surely and swiftly, if he makes it clear to his superiors that he is ready for larger service and a larger sphere. The humble retailer can burst the walls of his small store, just as Timothy Eaton did, if he gets the right idea and follows it. It is not a matter of brain or education so much as of purpose joined to energy and labor. The salesman or manager or bookkeeper or secretary can lift himself to a higher plane of service and rewards if he prepares himself diligently for larger work and pay. The small manufacturer, the company director, the broker—all can become enlarged in the nature of their enterprise and in the amount of their income—by resolutely setting themselves about the task of growing to be bigger-minded men.

Specialized information is the great idea. This is what the world pays handsomely for. And to acquire specialized information is really a simple matter, calling for the purposeful and faithful use of time. This chiefly.

One does not have to stop his ordinary work, or go to a university, or to any school. One can acquire the specialized information in the margin of time which is his own—in the after-hours of business. Which means: If a man will read the right kind of books or publications, and make himself a serious student at home, in his hours—the evening hours or the early morning hours—he can climb to heights of position and pay that will dazzle the inert comrades of his youth or day's work.

IF business—BUSINESS—is your chosen field of work, we counsel you to read each week THE FINANCIAL POST. It will stimulate you mentally. It will challenge you to further studious effort. It will give you glimpses into the world of endeavor occupied by the captains of industry and finance. With the guidance of the POST, and with its wealth of specialized information, you, a purposeful man, aiming to go higher in life and pay, will find yourself becoming enlarged in knowledge and ambition, and will be acquiring the bases and facts of knowledge which become the rungs of the ladder you climb by.

It is the first step which costs. But this cost is trivial—a single dollar. We offer you the POST for four months for a dollar. Surely it is worth a dollar to discover how right we are in our argument. If you have the will to go higher in position and pay, sign the coupon below.

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Send me / us THE FINANCIAL POST for four months for one dollar.

Money to be enclosed / remitted

Signed .....

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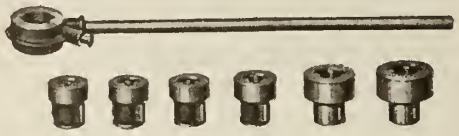
For Easy Cutting



THE pipe-threading problem is readily solved when **Beaver Easy-Working Die Stocks** are used. They cut quicker and save labor, time and money.

They eliminate troublesome bushings and the bother of changing dies.

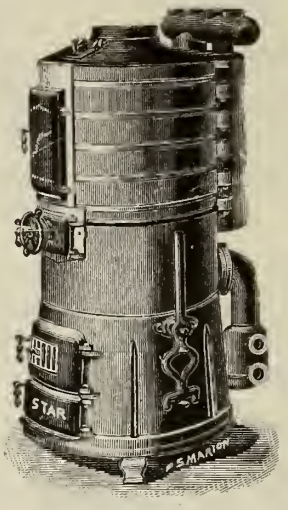
Beaver Threaders are easily adjusted. Simply "move the handle—that's all."

Beaver Tools are absolutely guaranteed. The user and the dealer are both protected.

Write us for descriptive circular and prices.

The Borden Canadian Company
110 Church Street - - - Toronto, Canada

Thousands of Star Boilers in Use requiring repair Parts



It will be a long time before folks forget the coal troubles of the last few seasons.

The principal feature of the Star Boiler is that no other round hot water boiler has any coal-saving improvement not embodied in the "Star."

Then, too, while boiler installation and repair time is here, why not stock up with Star parts, for which O. Belanger has taken over the rights and is now making?

Many thousands of Star Boilers are in use requiring these repair parts hitherto unobtainable.

Write to us at once in time to catch the season's business.

We guarantee prompt deliveries.

O. BELANGER, REG'D.
Amherst Street
MONTREAL

The Wrench of 25% Greater Efficiency

TRIMO PIPE WRENCH

Two new features have been recently added to the Trimo Pipe Wrench, namely Nut-Guards, in all sizes, and unbreakable steel frames, in leading sizes.

The Nut-Guards prevent the accidental rotation of the nut while in use.

These improvements add 25% to the usefulness of the tool.

The Trimo Pipe Wrench is made with wood handles in 4 sizes, 6-in., 8-in., 10-in., 14-in. and in steel handles in all sizes, 6-in. to 48-in. inclusive.

All Trimo Pipe Wrench parts are interchangeable.

The inserted jaw in the handle can be readily replaced when worn, thus adding to the life of the tool.

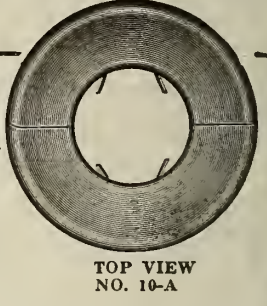
Nut with Nut-Guards

Inquiries from Importers and Dealers Solicited. Send for Catalogue No. 55.

TRIMONT MANUFACTURING CO.
Cable Address: Triwrench Code: Western Union
Roxbury (Boston) Mass., U.S.A.

OPEN VIEW NO. 10-A

The CEILING PLATE that's better



TOP VIEW NO. 10-A

THE NO. 10—A NARROW FLANGE PLATE—IS A STEEL HINGED PLATE. FLANGES ¾" WIDE. HIGHLY FINISHED. ESPECIALLY DESIGNED FOR TWIN CONNECTION "NARROW."

Gem No. 4.

The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

High quality at the right price.

Gem No. 4 Automatic Air Valve

Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

Write for catalog showing our complete line of specialties.

The BEATON & CADWELL MANUFACTURING Co.
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Lead Traps — Lead Pipe

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Closet Combinations

Enameled Ware — Boilers — Pipe — Fittings

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Write for a copy of our new Catalogue

There Are Lots of Gate Valves

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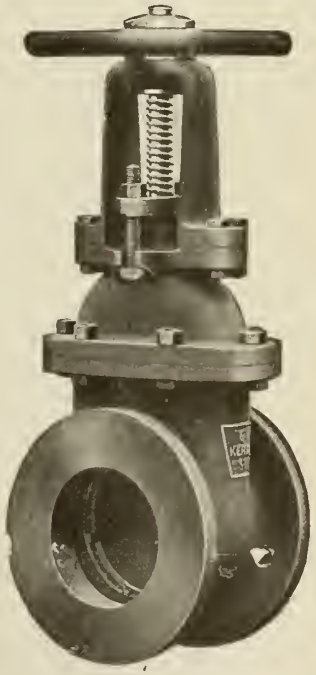
but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.
Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.
Approved by the Fire Underwriters' Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

EVERY FITTING TESTED

Why Pay Extra for Copper?

Economize by buying *"Vitro."* The Tank without a lining. A tank that is made of material not liable to absorb moisture. All in one piece. No need of repairs. The *"Vitro" no-trouble* tank is made right. It never leaks.

Neat in Appearance

Silent in Operation

OUR GUARANTEE

A new Tank will be given to replace one that at any time proves defective from either material or defective workmanship.

Write us for a **VitrO** Catalogue.

Galt Brass Company, Limited

Galt, Canada

EVERY TANK GUARANTEED

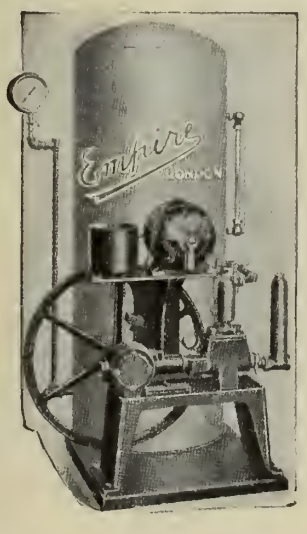
Sanitary Engineer

Plumber and Steamfitter of Canada

VOL. XIII. PUBLICATION OFFICE, TORONTO, MAY 1, 1919 No. 9.

The Sanitary Engineer And The Farmer

FARMING communities are no longer content with the old, antiquated sanitary and water systems. Why should they be? Why should they not enjoy the pleasures and comforts that heretofore have been restricted to city life?



The farmers' wives want running water in their homes. They want it hot and cold for bathing and all other purposes—they want indoor lavatories, indeed everything. And, what is more, they can pay for it. Money was never so free in the rural community.

Here, then, is where the sanitary engineer and the farmer can get together. Hundreds of farmers all over the Country are looking for improvements. Many of them contemplate building new homes, having water and electric lighting systems installed, but the sanitary engineer must make the first move.

We help you by placing absolutely complete lines of all these requirements at your disposal. There is nothing in this line we cannot supply. Write us for our illustrated Catalogue. Our facilities are at your service.

EMPIRE MANUFACTURING CO., LIMITED

LONDON AND TORONTO, CANADA

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While

A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for BEAVER BRAND CAST IRON ENAMEL WARE

Amherst Foundry Co., Limited

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AGENCIES:

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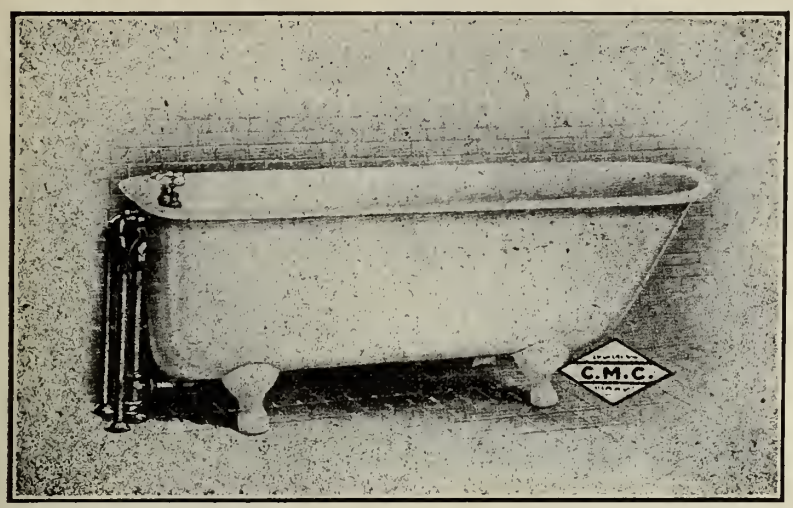
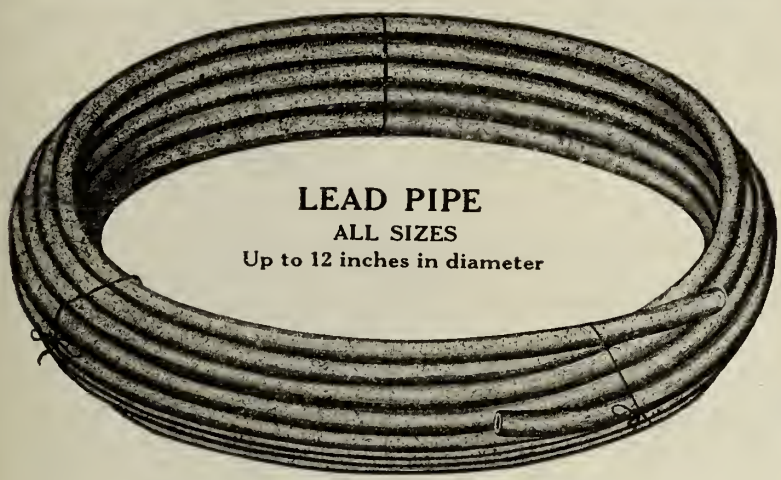
Everything in Plumbers' Supplies



The careful buyer chooses only those products which have stood the *"tests of years."*

C.M.C. Products have been on the market for 30 years. The Canadian Plumber has come to recognize them as "last word" in superior service and dependable quality.



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Aristocrat Laundry Tubs,
Traps and Bends,
Easy Wiping Solder,
Iron Pipe and Fittings,
All Brass Goods,
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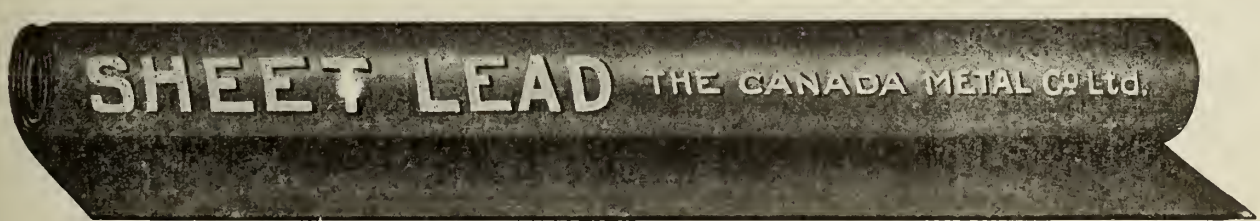
We ship Promptly. Write for Catalogue "A"—it's FREE.



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TORONTO, CANADA

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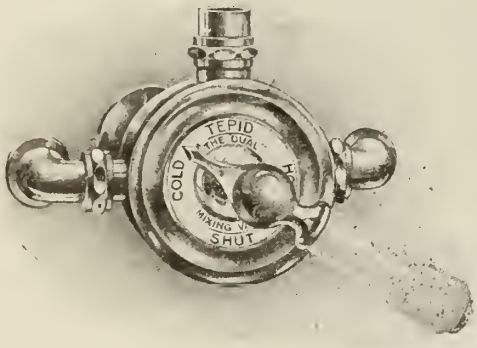
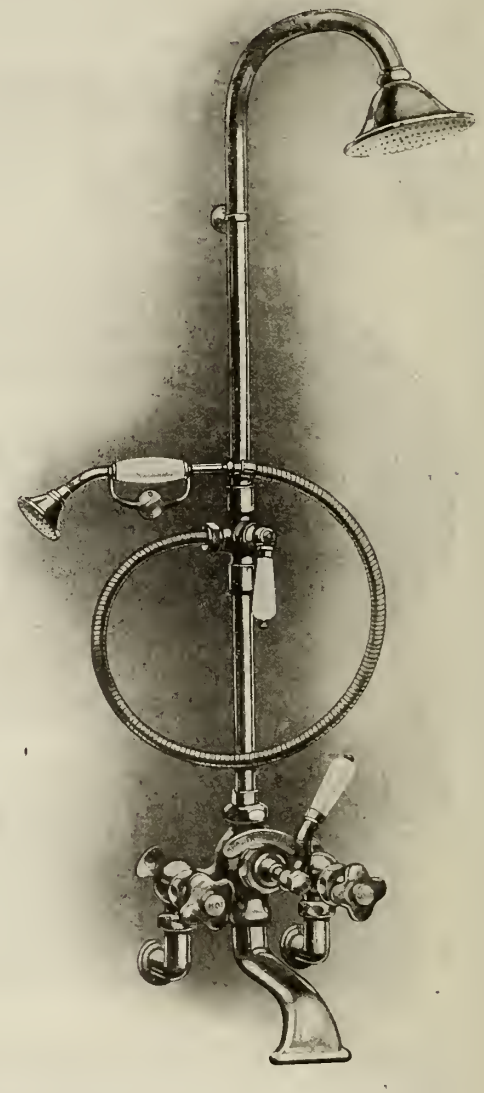
And at
9 Fenchurch St.,
London





"Dual" Mixer

A valve that really mixes Hot and Cold Water, and maintains a uniform mixture.

For ease of operation, simple construction and easy installation, it has set a new standard of efficiency.

Cold Water must be turned on first, no possibility of scalding.

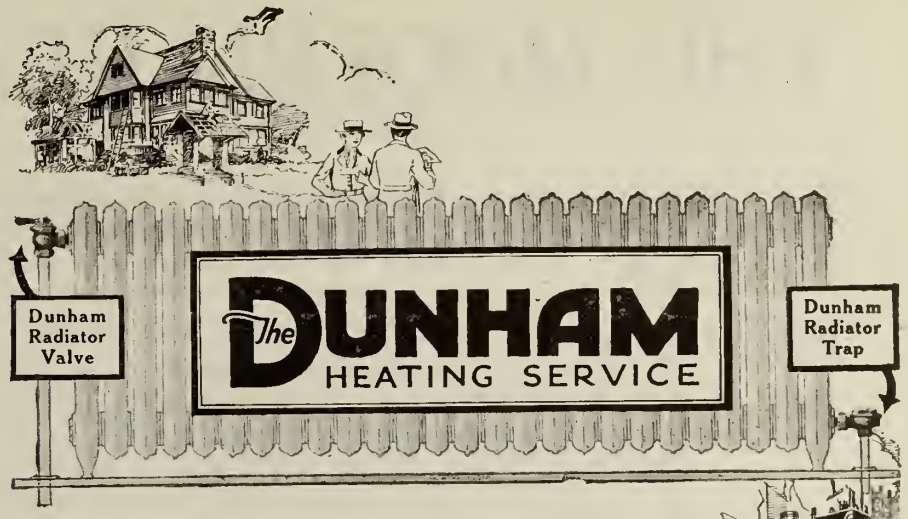
Made in several forms for Showers, Sprays, Operating Rooms, etc.

At the well-known works of Messrs. Brunner, Mond & Co. these valves provide baths for 2,500 employees.

G. & W. G. GUMMER, LIMITED

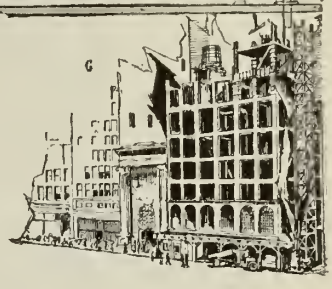
Manufacturers of every description of

Engineers,' Plumbers' and Sanitary Quality Brassware



For Any Kind of a Job

When specifying steam heating equipment you will find it convenient to remember that Dunham Specialties are available for any kind of a job. So are the services of our Engineering Department. Please address all of your questions direct to us for a prompt reply.



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DOMINION RUBBER SYSTEM
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You support Canadian industries, besides supplying your customers with the best quality of rubber goods, when your fixtures are fitted with the "CANADIAN" brand of Bumpers, Tips, W.C., Floor Flanges and Slip-Ring Washers.

The best manufacturers and jobbers of plumbers' supplies buy the Dominion Rubber System products, because the Dominion Rubber System stands back of each product.

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are located at:

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Why Jenkins Bros'. Valves Are Superior

Fig. 106

They are the original renewable Disc Valves. They have more imitators than all other makes of valves combined. They have kept pace with increasing steam pressures and severe working conditions. They are of the simplest design, and can be easily repaired by any man of ordinary intelligence. They are made interchangeable in every part, and any part can be duplicated promptly and inexpensively by the dealer. In the majority of cases they can be repaired by merely changing the disc without the laborious task of regrinding.

Fig. 108

Fig. 114

They are recognized as the Standard Steam Valves in all parts of the World, and wherever there are supply houses—Jenkins Bros'. Valves will be found. The Standard of quality never changes except to improve, and while to-day there are hundreds of imitators, the sales of genuine Jenkins Bros'. Valves are constantly increasing.

Catalogue No. 8 sent free on request.

Fig. 124

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LIMITED
Agencies in all the Principal Countries of the World

EUROPEAN BRANCH:
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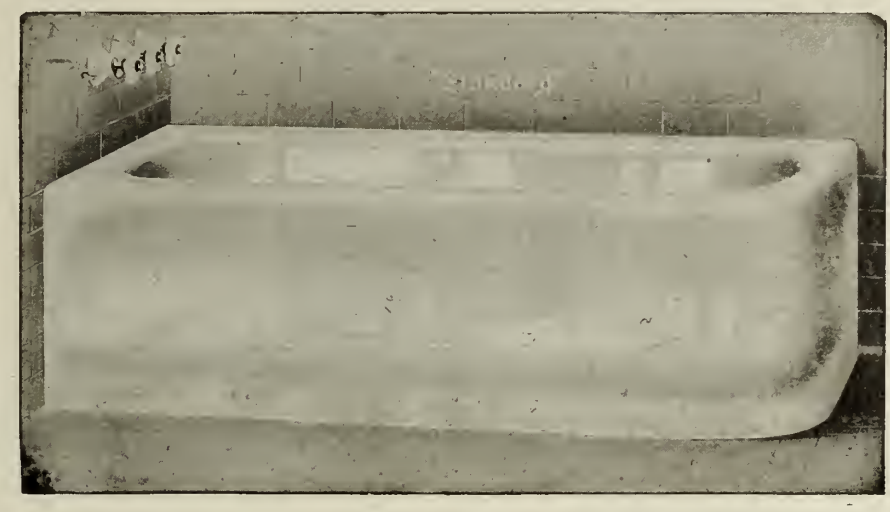
"Standard"
"Perfection" Built-in Baths

Made in One Piece Enamelled All Over



These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in-Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners meaning bathroom sanitation.

Made in 5 and 5½ foot sizes.

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"MADE IN CANADA"

WE SPECIALIZE IN

PIPE THREADING TOOLS

Take Another Look At This Job

ESTABLISH PEACE

If you desire to establish lasting peace in your shop, you will have to furnish your men with good tools. Men will not do the same amount of work if that work is hard. The more you *INVEST* in tools if they're good tools, the less you will SPEND in labor. To invest is to establish an asset, to spend is to create a liability. Our tools will save you money and make peace in your shop.

ESTABLISH PROFIT

Work made easy becomes a pleasure. Jardine and Toledo Pipe Threading Tools make threading pipe so easy that a boy can thread a 4-inch pipe as easily as he can thread a ½-inch pipe.

Not only so but when a thread is made with one of our tools it's a good thread. No cutting off pieces of pipe. No lost time and no leaks. That's the way to establish a profit on every job.

A. B. JARDINE & COMPANY, LIMITED, HESPELER, ONT.

Sole makers of "Jardine" Pipe-Threading Tools.
Sole licensees to manufacture and sell Toledo Pipe-Threading Tools in Canada.
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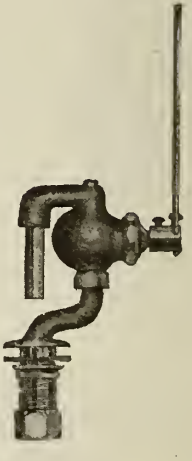
Because a satisfied customer means more business for you.



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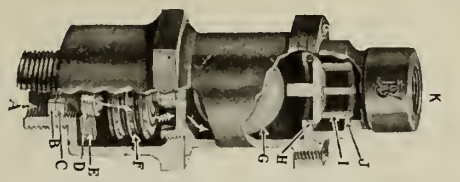

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Relieves the System of Air and allows no water or vapour to escape.

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BULLETIN No. 1.

Earn the good-will of clients by advising them to include gas piping in the Plumbing Contract.

Every building needs Gas for one purpose or another—No building is complete unless adequately piped for Gas.

Gas is acknowledged to be the cleanest — most economical and most dependable fuel.

Phone Adel. 2180, "Builders' Service Bureau," and our representatives' experience is at your service—free.

The Consumers' Gas Co.

19 Toronto St. - - *Adel. 2180*

"Daddy, did you get that heating Contract?" "I Sure Did!"

"SAY, Daddy, me and mother *knew* you would get it, all the time!"

"Yes, you funny little fortune-teller, *I* was sure of it, too!"

"Why, father?"

"Because Dad always bids on MOLINE HEAT installations! If a schoolhouse is to be built so little girls like you can be warm and comfortable in it, I tell the building committee how Moline Heat has heated other school buildings, all over the United States. If a man is going to build a home in which he and his family are to be always warm and comfortable, I tell him how Moline Heat has heated other homes, all over the United States. Moline Heat, you see, always heats *any* sort of building the way a building *ought* to be heated. The installation always gives *permanent* satisfaction. That's why one customer is always glad to tell other people about Moline Heat. And that's why your Dad gets so many contracts from people who want only *the best.*"

Moline Anti-Syphon Seal takes the place of automatic traps.

"Gee, I'm *glad* you handle Moline Heat, Dad!"

"I guess your mother is, too—it's made our bank balance grow so big!"

If you want to know how "Dad" gets all of these contracts write today for the Moline Heat catalog.

Some good territory still open for special sales representatives. *Address Dept. G.*

Moline Illinois

SANITARY ENGINEER

PLUMBER AND STEAMFITTER OF CANADA

ESTABLISHED 1907 PUBLISHED TWICE MONTHLY

Vol. XIII. MAY 1, 1919 No. 9

CONTENTS

"Service" Success Secret of Galt Firm 11
Outlook Generally Shows Improvement 12
Keeping the Shop Men Busy Ten Hours a Day 14
New Technical School, Hamilton 15-16
Making Your Advertising Work 17
Boost the Cardwriter; Make It Hum 18-19
Ontario Housing Committee Report 20-24
Current Events in Photograph 21
How About Trade Expansion?.....25-26
Four-Page Bulletin Grows to Twenty-Eight 27
Editorial Comment 28-29
Practical Sheet Metal Work 30-31
Heating and Ventilating Department—The Chimney.....32-33
News From Here and There 34-35
Market Conditions and Tendencies..... 36-38

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TRADE PERFECTO MARK

"PERFECTO" BRASS GOODS, as the name implies, are as perfect as it is possible to make them. The long service they render to the purchaser is productive of more sales for the Plumber. They cost no more than less "perfect" products and we stand back of every sale with a positive guarantee.

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Any article of our make proving defective through inferior metal or improper workmanship, on our part, will be replaced with TWO good ones, at NO CHARGE to you.

Write us now for further information and prices.

GALT BRASS COMPANY, Limited

GALT -:- ONTARIO

FOR MORE PLUMBING WORK

In looking over our correspondence, I find an enquiry asking why our Company does not conduct an advertising campaign such as we have suggested for the trade as a whole. It can't be done.

At least it can't be done and maintain the policy of the Company in distributing its products through the jobber, and recognizing the plumber as the last channel through which all plumbing material should go before it reaches the ultimate consumer. Direct advertising for the purpose of creating a demand for our goods means direct enquiries, and rather tends to destroy a system which is at once logical and economical.

Still we want more business and in this period of re-adjustment and reconstruction much work must be done, and a great deal of money spent to educate the public and create a better demand for plumbing work. This work is necessary; it has been neglected in the past four years and the only question now is how this fact can be best brought to the attention of the public.

Our opinion is that it should be done by and through the plumber with the assistance of the interested manufacturer, but how is the question? All these semi-monthly talks to plumbers are for the purpose of getting an expression of opinion. Will you consider it? It means selling two bath-rooms where one was sold before.

Have you our latest booklet, "Enamelware For The Factory?"

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Established 1907 Circulates Throughout Canada

Sanitary Engineer
Plumber and Steamfitter of Canada

Published First and Fifteenth of Month

Vol. XIII. TORONTO, MAY 1, 1919 No. 9

"Service" Success Secret of Galt Firm

Scott and Bennett Stock Quality Goods and Then Let the People Know They Have Them—Progressive Methods in All Departments Have Resulted in Steadily Expanding Business—Electrical Fixtures Big Line

Neat, attractive window displays add prestige to any store. This illustrates a display recently arranged by Scott & Bennett, Galt, Ont.

SELECTING a stock of quality goods and then displaying it attractively has been the cornerstone upon which Scott & Bennett, plumbing and electrical workers, Galt, Ont., have built up a steadily improving business. The prospective buyer no sooner enters the main door of the premises than he finds himself facing a display of electrical fixtures that is most artistic. Especial care has been given by the firm in arranging the fixtures so that buyers can gain a fairly accurate idea of just how they will look when installed in the home. The whole general effect is most pleasing and while a number of different designs and styles are shown the arrangement is such that buyers are not bewildered. On the contrary they can decide quickly and accurately whether such and such a design would harmonize with the general plan of the room for which they require it or whether another design could be used with better effect.

Not Easy to Do

It is not an easy thing to take a lot of fixtures and arrange them so that all will show to their best advantage. It is an important matter though, from the point of salesmanship, to be able to do this and still more important to be able to do it and do it artistically in a limited space.

Besides the electrical fixtures this showroom also contains a plumbing display among which are featured a couple of pedestal lavatories separated from the other lines, shown so as to suggest their best selling points to the casual purchaser.

The rear portion of the show room is used for office purposes and is separated from the display area by a neat counter railing and well-designed pillars.

Plumbing Display

A room beyond is used exclusively for displaying plumbing goods and all the latest designs and up-to-date installations are shown. In arranging the displays care has been taken to leave plenty of space so that prospective purchasers can examine the various lines and see how they work. The same general effect is carried out here as in the

electrical display that buyers can see just about how the goods will look when installed in their own homes.

Throughout the plumbing and electrical displays the suggestion is unconsciously gained by the arrangement and variety of the goods that Scott & Bennett not only have a large and complete stock but that they have goods of high quality and that the firm is prepared to render service.

Big Help in Selling

An impression of this kind working unconsciously in the mind of the buyer is a big help to the dealer in helping him close sales. It is often stated by some of the biggest firms in the country that goods well displayed are half sold, and while this may be a trifle exaggerated good display is undoubtedly a tremendously important factor in selling. The firm that not only displays its goods well but shows a stock that says plainly: "We carry only the best class of merchandist," has gained another big step in closing the sale.

This is the impression a visitor to the display rooms of Scott & Bennett obtains whether it is in the electrical section, the plumbing goods or the section where bathroom fittings are shown.

Business Has Grown

James Scott stated to SANITARY ENGINEER that the business has grown steadily. Mr. Scott is modest about the matter but the whole secret of this growth from the small beginning to a leading place in the business life of Galt, has resulted from the practice of good methods, two of the most important being careful selection of stock and then proper display. The firm has kept pace with modern developments that make for service. A motor truck delivery has displaced the old time horse and wagon, and in the shop time-saving devices have been installed to enable the twenty employees to produce maximum results.

Taken to the Job

The workshops are not extensive but Mr. Scott explained the plans which have been adopted to practically transport the workroom to the job, This not only makes for service where the customer is concerned but saves space for the firm.

The heating department occupies a large place in the activities of Scott & Bennett, and a stock of reserve radiation is carried as well as all lines required for quick action in case hurried changes are necessary or repairs required. A large warehouse at the rear of the building is stocked both upstairs and down with plumbing and heating materials. This is invaluable from a service standpoint as it means that no matter how quickly a client may call for material or repairs the firm is in a position to handle the order promptly. It is this sort of service that means repeat business and that causes one satisfied customer to tell about the good service he secured and bring others.

Get Other Trade Too

The firm has a large yard and in this is kept a stock of vitrified tile, fire brick and similar materials. These are not usually included in the regular stock of sanitary and heating firms and bring in a lot of good business that carries a good profit. This stock is arranged carefully and neatly so that whatever is required can be found quickly. Attention is also given to providing facilities by which the heaver materials can be handled easily and quickly, thus saving time, trouble and expense.

Added to their idea of service to their customers, Scott & Bennett have enthusiasm. They are enthusiastic about their profession, about their stock and about their service. They have been careful to get goods that their experience has taught them will give results and that they can stand behind. To this they bring the technical knowledge requisite to making a satisfactory job and they take the pride in doing this that good workmen always feel in work well done.

Business Detail

This same spirit of progressiveness and aggressiveness is apparent in all departments and is a combination that makes success. The same care is given to cost-finding, to accounting, to collecting and the other details of business that are applied in getting and filling orders and the result has been a steadily expanding trade.

Outlook Generally Shows Improvement

Representative Manufacturers Speak of Conditions To-Day—Feeling Optimistic—Trade Better—Prices Seem Settled Getting a Fair Return For Work—Aggressive Tactics Needed

"BUSINESS has been steadily improving and is a lot better now than it was last year this time," said O. L. Robb, manager of the Toronto branch of the Empire Manufacturing Co., of London, Ont., in discussing business conditions and the general outlook with SANITARY ENGINEER. "There has been a lot of building started recently and indications are that there will be a lot more. As far as Ontario is concerned the situation is good and I am told that Western business has been very good.

One of the things which has tended to make conditions unsettled somewhat in Ontario has been the uncertainty existing over what the Ontario Housing Commission is going to do. It is time the Commission either did something itself or let somebody else do it. Men who have proceeded with the erection of dwellings were deterred from starting because they did not know whether if they started a row of cheaper houses built by Government funds would be erected alongside of theirs. The Commission has been busy for six months or more and there is nothing to show in the way of results. There is no question about houses being needed, and if it had not been for the uncertainty caused by the prospect of the Commission going ahead with something, others would have been busy long before now."

Prices Have Settled Fairly Well

Mr. Robb stated that with the possible exception of enamel goods he does not look for any reductions in prices for many months. It was not certain that enamel goods would be lower, but from reports he had had from the United States, some readjustment in prices might be made in from three to six months.

"There have been a good many readjustments in prices of plumbing goods recently," said Mr. Robb, "and I do not look for any further changes for some time."

Mr. Robb stated that he rather favors the "open price" system, which was outlined in the last issue of SANITARY ENGINEER, as a means of getting away from price cutting.

Getting a Fair Return

"There is no question that price cutting is one of the greatest evils in the trade to-day," he said. "Many a plumber has cut and slashed because he thought some other chap was figuring on the work in hand, only to find out that he had been cutting under himself. What the trade needs is to get away from this sort of thing. There is no need for it and the Ontario Association can do a good work in taking steps to eliminate it. One of the reasons for it is perhaps the lack of business training. There have been too many men start in with a kit of tools and a few supplies and no knowledge whatever of the principles of business. They go after contracts and cut prices to try and land the job, and then when they get it, and it is finished up, and things paid for, they discover they have been working for nothing. There is another factor in the situation also. The man who takes a job too low is going to try by every means he can not to lose on it, and that does not make for good workmanship or materials or for a satisfactory job. The plumbers are willing, if paid reasonably, to do good work, and they are entitled to a fair profit for their work. John W. Irvine, of Detroit, whose address was reported in last issue of SANITARY ENGINEER, is working along the right lines. The plumbers should put their business on a business basis and not work for nothing."

Continued on page 33

Maintaining Quality Proves a Winner

London, Ont., Firm Have Built Up Reputation With People of City and Surrounding Country—Pleasing Their Fellow-Workers—Good Materials and Good Workmanship Are What Count, They Say

This shows the bright attractive showroom used by Noble & Rich, London, Ont.

DOES it pay to move from a location on the main street to a residential street adjacent to the business section and within easy reach of all the main car lines? The experience of Noble & Rich, of London, Ont., indicates that quality in stock and workmanship, backed by aggressive business methods, will bring trade regardless of location. The firm moved from their premises on Dundas St., the main thoroughfare of London, to a residence on Queen's Ave., a block away, and have built up a big business. They converted the residence into a splendidly equipped show room and workshop. They still have a splendidly central location, which, for all practical purposes, is as good as the one they formerly had, and have greatly reduced their overhead expenses.

Quality the Standard

"Quality" in supplies and workmanship has been the standard of the firm. They aimed for the whole city and the people in the surrounding country to know that any goods purchased from Noble and Rich, or any work turned out by them, was first class. Probably no one appreciates this phase of the business as thoroughly as the plumber or steamfitter himself and it is a notable fact that Noble and Rich have built up a reputation for these qualities, not only with their customers, but with their fellow workers. Their stock is known as one of the best; their shop is splendidly equipped, not only with materials, but with capable workmen, to take care of the emergency job or the regular work. A status of this kind usually takes time to acquire, but once it is acquired, it is invaluable to the firm.

Applies Equally

In an interview with SANITARY ENGINEER it was made clear that this standard of quality was rigidly adhered to by the firm. It applies just as definitely to a small job as to the largest and most intricate installation. The job has got to be right and the customer satisfied. Price-cutting on contracts, so often attended by the most serious results, both to the firm doing the work and the customer, is one of the worst evils with which the trade has had to contend. Noble and Rich have had to meet it, not once, but many times, but by remaining true to their "quality" slogan they have won out. Not only won out, but gained a reputation that is standing them in good stead.

An instance of this price-cutting occurred while SANITARY ENGINEER was in the office. A householder had asked for a figure on a small installation and an opposition firm had given him a quotation fully $40 lower than the actual cost of the materials and the workmen's time. It was obvious that either the firm doing the work was going to stand a serious loss, or the job would be done with inferior materials and the proper workmanship skimped. Another bad feature of the case was that from the standpoint of the man wanting the work done, for a time at least it appeared that the "quality" firm was out to rob him. In cases of this kind, Noble and Rich have invariably found that it pays every time to figure

Continued on page 35

Keeping the Shop Men Busy Ten Hours a Day

Brosseau and Frere, of Quebec, Have No Idleness — Nineteen Years in Business Sees Big Growth—Proprietor Should Aspire to More Special Work —Why Not the Plumber for Electric Installation, Too?

FOR nineteen years Brousseau and Frere, sanitary plumbers and heating engineers, have been following their chosen line of work on St. Joseph Street, Quebec City. The story of this enterprise is one of progress, and the experience of Mr. E. G. Brosseau, under whose direction the plumbing and heating and the electric wiring and vacuum departments are placed, covers nineteen years of constant change. In the evolution of the venture from a very small beginning, in which $200 cash was invested, the firm has much satisfaction in the fact that it can now handle any type of contract, no matter what its nature and regardless of its extent. In support of this it is interesting to relate that the firm is now engaged on a $35,000 job in the city of Quebec. This work is in a large boys' school, and it will take several months to complete the heating, ventilating, electric wiring, vacuum system, etc. By being qualified to undertake the whole work, Brousseau and Frere were here able to tender for and to secure one of those contracts which, very frequently, are only sought by the very large contracting firms. And entailing a real risk, as such work does from the standpoint of being within one's proper estimates when the work is completed, Mr. Brousseau is satisfied that his contract will yield him a good profit.

Always a Student

To the representative of SANITARY ENGINEER who recently called on this firm, Mr. Brousseau said: "I have always studied and am going ahead with my studies still. Much of this study was secured in night school, and one can always keep busy learning something new."

Therein is surely one of the secrets of Brousseau and Frere's success. So many of us are content to take things as they are and to give way willingly to the temptation to stay in a rut, that it is refreshing when some have grasped the important idea that there is no standing still, that one must progress or retrogress. It takes time to give heed to new methods, to really evolve new ways of working out shop methods and so on, but here, as elsewhere the time and care taken in these respects pays well. In days of keen and still keener competition it is pretty sound advice to the plumber when a brother plumber attributes his own success to these principles as Mr. Brousseau does.

In following his studies, Mr. Brousseau has not confined himself to the one subject but to several. Thus he has kept well posted on such new innovations as vacuum heating and vacuum cleaning developments, as well as on electric wiring in its many branches. A big argument this when one considers to what extent methods have changed within the past ten years. It pays to be posted.

Time Sheets—Shop Orders

Time sheets are given each man. Mr. Brousseau says that this has been a good plan. It places every workman on his own responsibility and is thus a factor in developing greater self-reliance. It also distributes the responsibility, for if one man had to look after the correct time of several it would be a considerable task in itself.

In addition to this all material is charged as it goes out of the shop. For instance, if the fitter wants some fittings and valves, pipe or galvanized iron he is required to order it. This is considered an excellent plan. Among the advantages is the important one of getting no more material on the job than is wanted. A man is more likely to get on the job just what he wants and to thus prevent accumulations that would tie capital up and also make a big excess of material on the job With the order from each man filed away, a careful checking is also made possible—a most essential and necessary element in making accounting accurate, for careful checking alone will go far toward making a job pay.

Statements

It is important that accounts should not be permitted to accumulate. The plumber and steamfitter generally conducts a credit business, for, with work uncompleted, he has no claim upon a spot cash plan such as many other merchants have where actual delivery of goods is effected the day the order is received It therefore is essential that the closest possible attention and care be given to accounts, and herein again have Brousseau and Frere scored an important plan.

"We send out statements every day," said Mr. Brousseau. "This is, on contract work. It has the advantage of enabling the customer to check up on the material and work he is having done. It saves disputes arising, for when a man is kept closely in touch with the progress of a contract that he has given he is the more likely to make less dispute when the work is completed. It is highly important that these disputes should be reduced to the minimum."

Checking Plans—Working Hours

Among other things, Mr. Brousseau carefully checks over the plans that he has been given to figure on. He entrusts this work to none but himself. If an architect has submitted a plan that has flaws in it, in so far as the heating and sanitary arrangements are concerned, Mr. Brousseau calls his attention to them. Thus, frequently, it is possible to suggest changes that will make for the better working of a heating system or a battery of urinals or closets. It is well, this firm believes, to work in harmony with the architect, but at the same time not to hesitate to point out flaws or inconsistencies where these exist.

"We are keeping our men employed ten hours a day," said Mr. Brousseau. "This is agreeable to them, for they are paid accordingly, and as we have the work for them to do we are glad to have them put in the full day. They have been busy like this all winter."

Progress Coming

While the Brousseau business has had fair scope for its work, the firm recently decided to make changes that will enable them to handle work to better advantage. In doing this an additional space was secured facing on St. Joseph Street, and alterations are now being made. When completed the change will enable all classes of work to be handled in an efficient manner, and particular attention will be given the display of the fixtures and electrical goods which are carried. Private offices and display space are two of the points being given particular attention.

Mr. Brousseau indicated very clearly to the writer that he believed in going ahead and in keeping one's staff busy at all times. It was better, even, to keep men busy by paying the present high prices for material than to await lower markets. In this connection the company had recently bought a quantity of pipe and the market afterwards declined several points. Mr. Brousseau said that he would like to have had the lower price, but that he was quite satisfied as he had the material on hand to keep his shop active. It was the best policy, he thought, to keep the men going the full length of the day.

A considerable volume of business is done right along in the matter of electrical wiring. Contracts are taken for any or all of the work required in this connection, and a nice line of fixtures is sold. The same are considered one of the profit bringers of this business.

C. A. DUNHAM COMPANY, LTD.

The following bulletins are being distributed by C. A. Dunham Company, Ltd., Toronto: Dunham Radiator Trap, Dunham Home Heating System, Dunham Return Systems, Dunham Vacuum Systems, Dunham Heating Data, Dunham Blast Traps, Dunham Radiator Valves, Dunham Oil Separators, Dunham Air Line Systems, How to Instal the Dunham Home Heating Systems, Dunham Heating Story, and Dunham Medium Pressure Traps. Copies of these may be obtained upon request by readers of SANITARY ENGINEER.

Description of the Hot Water Heating Plant and The Low Pressure Steam Ventilating System in the New Technical School, Wentworth Street, Hamilton, Ont.

Written especially for SANITARY ENGINEER.

THE heating and ventilating plant as here described is now being installed by Adam Clark, Ltd., in the new Technical School at Hamilton, Ont. This building is the first unit of a group which, when completed, will occupy a block bounded by Sanford Ave., Wentworth, and Huron Streets. The property is approximately 400 feet wide by 610 feet deep.

The accompanying plan shows the general lay-out of the proposed buildings. That part of the drawing showing in heavy lines and with the area cross-hatched indicates the building which is now being erected.

This building is four stories in height and on each floor there are three standard class rooms, a large workshop or factory, lavatories, and stair and elevator enclosures. The second floor, as here shown, is typical of all floors.

The only part excavated under this building is that roughly indicated by the dotted lines on the block plan. In this basement there is to be installed the "Vento" radiators used for heating the fresh air, the individual electric fans used for driving the fresh air to the different parts of the building, the three hot-water generators or convertors, a hot-water tank, and the return pump.

The boilers are in a separate basement situated as shown on the block plan.

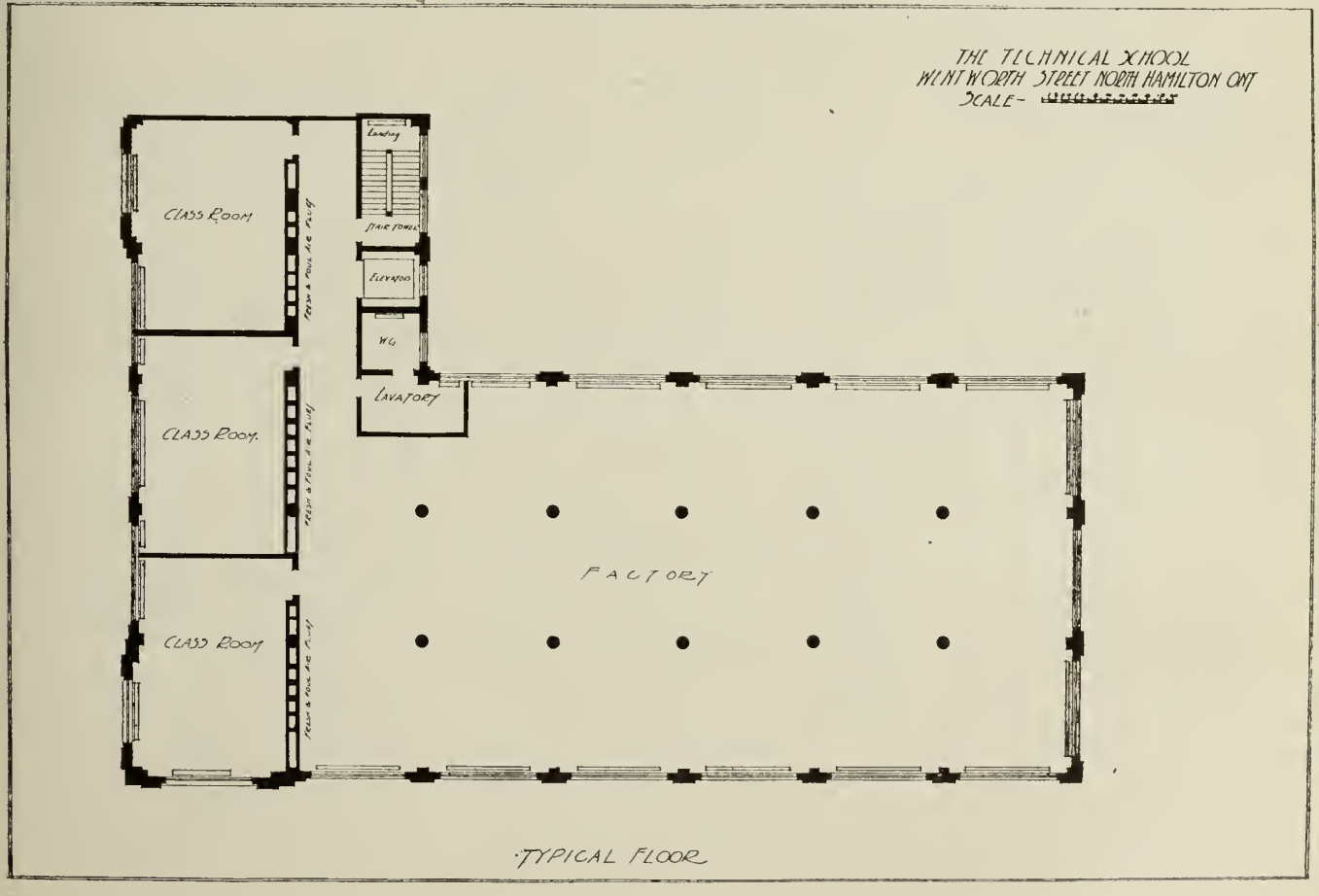
The ventilating portion of this plant is a separate and distinct unit of the equipment and is not to be confounded with any part of the heating system, with the exception that the steam used in the Vento coils is taken from the boilers connected to the heating plant.

The air for ventilation is warmed by steam-heated Vento radiators.

The heating of the building is by hot-water radiators. Three low-pressure water-tube self-feeding boilers, with a rated steam capacity of 8,000 square feet each, are set up by the boiler room and are connected by way of 6-inch heads to an 8-inch steam main running in a tunnel across to the basement under the school. The first branch off this 8-inch main is a 6-inch lead to the Vento coils. After the 8-inch main passes this 6-inch branch it is reduced to 5-inch and continues thus to the three convertors. This 5-inch main also has a 1-inch lead to the small convertor used for heating the domestic hot water.

The condensation return from the Vento coils is 3½-inch. The condensation return from the convertors is also 3½-inch, and these two returns are connected by means of a 4½-inch head to the receiving tank. A small electric pump drives the condensation back to the boiler through a 4-inch pipe.

The convertors are made up of brass or copper tubes and are constructed so that there is a "tube within a tube." The steam passes around the outer tube and through the inner tube and heats the water that is contained within the annular space between the two tubes. The water heats very quickly in the conver-



tors and the circulation that takes place is much the same as that in the ordinary type of boiler, the only difference being that steam is used instead of fire as a heat generator.

These convertors are fitted with feed and returns, just as are ordinary heating boilers, and connections are taken off in the usual manner with 7-inch feed and returns.

The three convertors are connected to a common feed head leading to a 5-inch main. The 5-inch main is carried through to the ceiling of the fourth floor, where it breaks into several branches leading to drop risers situated along the outer walls. In arranging the branches it was the aim to distribute the piping in such a way that the first radiator to receive a feed should be the last to return. The top of the 5-inch main riser is vented to an expansion tank situated in the pent house. The expansion tank is closed and it fitted with a 15 lb. relief valve.

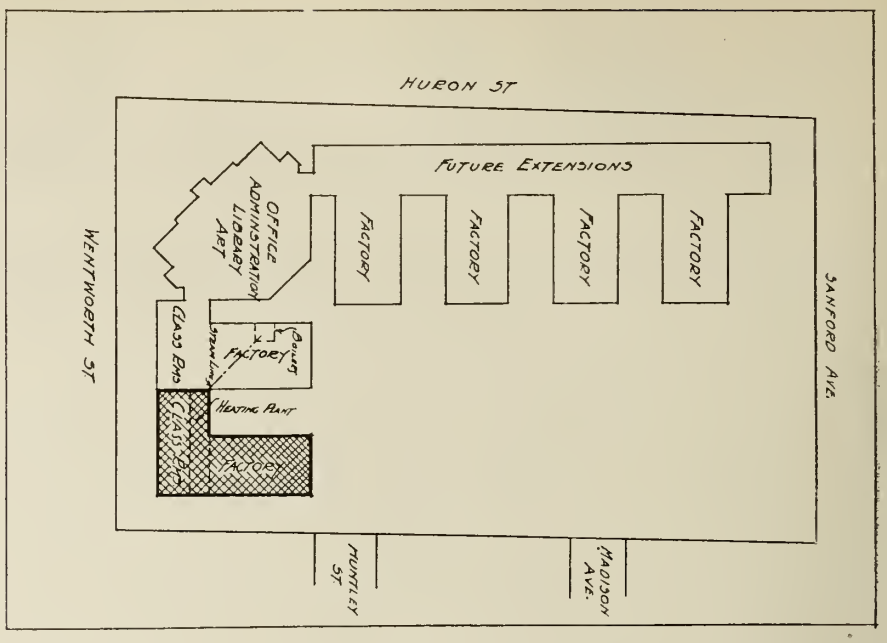
The feed and return risers are generally arranged so that each serves for eight radiators. Most of the feed risers have a load of 1,584 sq. ft., and are 2½-inch in size.

The largest feed to any radiator is 1¼-inch, feeding 225 sq. ft.

The radiators are of cast iron, generally from 44 to 50 sections in length, of the 3-loop type and 32 inches in height. They are all of the hospital pattern and are tapped at the top for feed and at the bottom for return at the same end. The return risers follow the lines and sizes of their corresponding feeds. The feet of these return risers connect to the return main which is run under the ground floor. At each corner and at other locations as required manholes with cast-iron covers are set so as to provide means of access and repair to this return main. The return main is connected to the convertors by way of connections of the same size as for the feeds.

The heating portion of this plant was laid out on the principle governing forced hot-water circulating systems, but as it is the intention to operate this system on the gravity principle it was decided to use piping a little larger than usually found in a forced system. A circulating pump could be installed without making any alterations to the plant, but with the static head that we have here a pump is not required. It is good practice when designing any kind of a heating plant where pumps are being used to make some provision for circulation when the power is turned off, and with a plant as here classified this becomes a simple detail.

It is the usual practice in forced hot-water heating systems to make use of a lock shield return valve to regulate the flow of water through any particular radiator. In this building an equalizing valve is to be placed on the feed end of each radiator. There is no valve on the return. The feed valve has two inner operating parts; one of these is in the form of an outer cartridge surrounding the valve. This cartridge has an opening similar to that of a quick opening valve; the size of this opening is graduated by an easy adjustment of the bonnet of the valve. If a radiator appears to be working so fast that there is danger of a short circuit being created it is a very easy matter to adjust the feed valve so that it will check that radiator off to the point required. This adjustment can be made without reference to the usual operating part of the valve.



Inasmuch as the system is self venting there will be no air vents on any of the hot-water radiators.

A rather unusual installation of ventilating fans is being made in this building. Instead of one large fan driving the air into a common distributing duct twelve small fans are being installed. Each fan is connected with the class room it serves and controlled from that class room, so that when a class is not in session the teacher can turn that fan off. Each fan is also connected by way of an individual duct to the plenum chamber situated in front of the fan.

Where the fresh air comes in at the back of the Ventos, deflecting dampers are to be installed to split the air currents up so as to supply an equal volume of air to all surfaces of these radiators.

The fresh-air intake is provided with a dust-proof screen, also an adjustable inlet damper.

The fresh air enters each class room through a diffusing face set 8 feet from the floor line. The foul air is taken from the room at the floor line into a vent flue, from whence it escapes above the roof. There will be no exhaust fans used in this work, but all vent flues will be fitted with check dampers.

There is a total of 1,336 sq. ft. of steam vento radiation used for ventilation and 15,956 sq. ft. of hot water for heating.

WINNIPEG WATER SYSTEM

In an effort to secure new industries for Winnipeg, special attention is directed to Winnipeg's great water system. Some of the engineering problems making possible the advent of Shoal Lake water are described as follows:

There are only four other communities in the world that have gone to a greater distance to secure their water supply than has Winnipeg.

The greater Winnipeg water aqueduct is one of the world's major undertakings. The length of the conduit is 96.5 miles. The water is brought to Winnipeg by the use of gravity. Difference in elevation Shoal Lake to Winnipeg is 294 feet.

To supply aggregate for concrete the greater Winnipeg Water district operated its own gravel pits and rock quarries, gravel crushing, screening and mixing plants.

Length of cut and cover concrete aqueduct with capacity of 85 million Imperial gallons per day is 77.5 miles.

Length of river syphons and pressure section of concrete aqueduct 7.1 miles.

Length of Red River tunnel constructed under the river with 5-foot cast-iron pipe lining 0.2 miles.

Length of 48-inch concrete pipe through streets of Winnipeg 2.3 miles.

The Water District operates its own railway, 110 miles long; owns its own locomotives and 115 coaches and cars, costing in all $1,439,622.27.

Reinforced steel used up to October, 1918, if rolled into rods ⅝-inch in diameter would stretch from Montreal to Regina.

Quantities of concrete used would provide 24-foot pavement 6 inches thick over 130 miles of streets, and would provide a concrete walk 6 feet wide wherever there is a sidewalk in Winnipeg.

The aqueduct crosses the Red River in a tunnel cut through rock 20 feet below the bed of the river.

Complete designs for all structures were made in Winnipeg and five to ten men have been employed making plans, analyzing and conducting field tests.

The cut and cover section of the aqueduct, 85 miles long, is so designed that the water will flow the whole distance by gravity without filling the structure to the roof.

Make Your Advertising Bring Results

Use Space Consistently—Field for Business Large—Give the News in Your Ads—Farm Trade a Factor—Get Your Newspaper Working

THE opinion seems to be held in many quarters that the average sanitary engineer, plumber and steam fitter is not an advertiser. There are many to whom the question of newspaper advertising presents no conception of the benefit which may be derived.

There are certainly benefits to be derived from the use of newspaper space and that many in the trade are using it successfully is quite apparent. Reproduced on this page are shown three of four typical ads which are being run by aggressive merchants, for when the plumber begins advertising the goods which he has to sell does he not step into the merchant's class?

It may be true, however, that the newspaper is not used as consistently and advantgeously by many as it might be. Some of those engaged in the sale of plumbing supplies look upon their stock as more or less inanimate objects which have no particular attraction for the consumer. It is to overcome this antipathy, if possible, that this short article has been prepared.

Field For Business Large

In the report of the housing condition which was just issued and some details of which appear in this issue, it will be noted that there are a very large percentage of houses even in the larger centres which are not supplied with a proper plumbing and heating system. This being the case, there is direct evidence that there should be more installations of bathrooms and furnaces and electric wiring and the best way to get your message to the householder is through the newspaper.

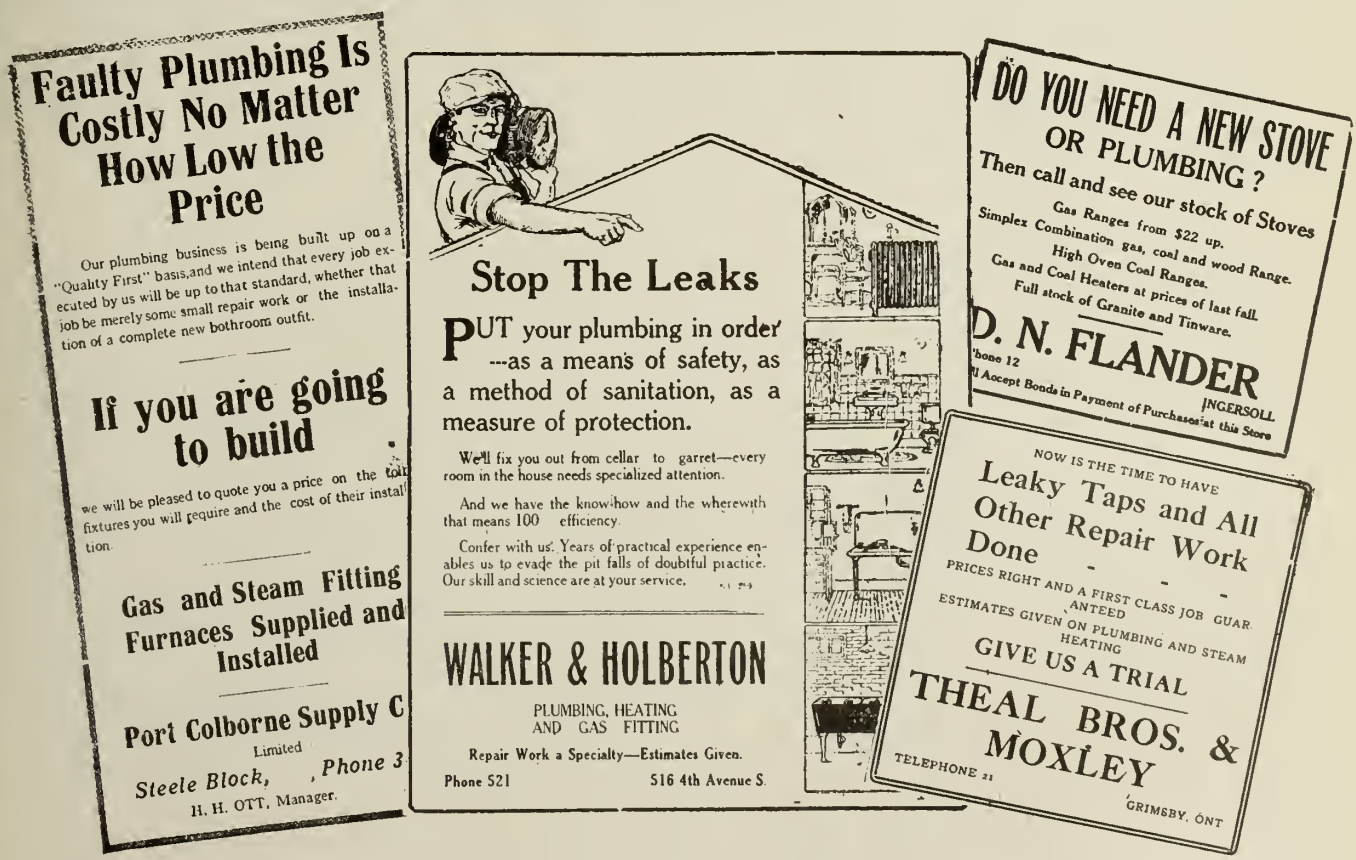
Farm Trade a Factor

In the smaller centres and to those who may be catering to a certain amount of farm trade the field is constantly increasing. The farmer to-day is perhaps one of the most prosperous men in the community, and he is looking around to see how he can make home life more desirable. The installation of a good plumbing system and water works system is not impossible and opens up a field for the aggressive sanitary engineer to develop. This trade is just in its infancy and to those who start early at the game and keep plugging away at it the results must come.

Give the News

The man selling plumbing and heating supplies has a direct appeal to make to his customers. It is not necessary then to be a special ad. writer. You have a message which, were your customer in your display room, you would have no difficulty in putting across. That is just what you want to get into your newspaper space. You have news to give your customers about the goods which you sell. That is what they want—real news, and to the man who incorporates this in his advertising the best results are almost sure to follow.

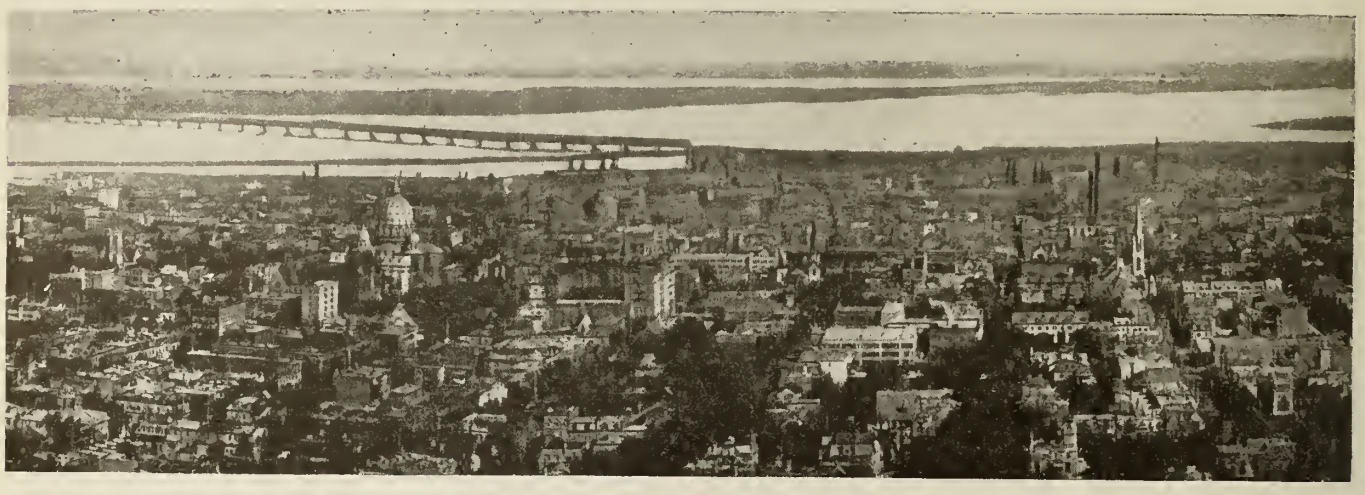
(Continued on page 35)


Faulty Plumbing Is Costly No Matter How Low the Price
Our plumbing business is being built up on a "Quality First" basis, and we intend that every job executed by us will be up to that standard, whether that job be merely some small repair work or the installation of a complete new bothroom outfit.
If you are going to build
we will be pleased to quote you a price on the tot fixtures you will require and the cost of their instal tion.
Gas and Steam Fitting
Furnaces Supplied and Installed
Port Colborne Supply C
Limited
Steele Block, , Phone 3
H. H. OTT, Manager.
Stop The Leaks
PUT your plumbing in order ---as a means of safety, as a method of sanitation, as a measure of protection.
We'll fix you out from cellar to garret—every room in the house needs specialized attention.
And we have the know-how and the wherewith that means 100 efficiency.
Confer with us. Years of practical experience enables us to evade the pit falls of doubtful practice. Our skill and science are at your service.
WALKER & HOLBERTON
PLUMBING, HEATING AND GAS FITTING
Repair Work a Specialty—Estimates Given.
Phone 521
516 4th Avenue S.
DO YOU NEED A NEW STOVE OR PLUMBING?
Then call and see our stock of Stoves
Gas Ranges from $22 up.
Simplex Combination gas, coal and wood Range.
High Oven Coal Ranges.
Gas and Coal Heaters at prices of last fall.
Full stock of Granite and Tinware.
D. N. FLANDER
'hone 12
ll Accept Bonds in Payment of Purchases at this Store
INGERSOLL
NOW IS THE TIME TO HAVE
Leaky Taps and All Other Repair Work Done
PRICES RIGHT AND A FIRST CLASS JOB GUARANTEED
ESTIMATES GIVEN ON PLUMBING AND STEAM HEATING
GIVE US A TRIAL
THEAL BROS. & MOXLEY
TELEPHONE 21
GRIMSBY, ONT

There may be a suggestion here. The use of an illustration helps out a whole lot. Advertising that is well done will bring returns—it is worth spending some time on.

Boost the Convention; Make it Hum

Get Back of Your Own Organization, the Canadian Society of Domestic Sanitary and Heating Engineers—Benefits to be Derived Many — A Fine Program— Come Prepared to Make Notes and Take Part in Discussions



Bird's-eye view of the Convention City, Montreal, taken from the mountain.

A PROGRAM of decided interest is being worked out for the annual convention of the Canadian Society of Domestic Sanitary and Heating Engineers, which will be held on June 3 and 4, in the Canadian Club Rooms, 101 Burnside Place, Montreal. The executive committee are to meet at 9 o'clock on June 3, and beginning at 2 p.m. the same day the regular sessions will be called.

That there will be something doing every minute of the time that is not only of interest, but of an instructive and profitable nature to every sanitary and heating engineer, is promised.

Conditions during the past year have tended to keep the members of the trade pretty closely associated with the shop. Now, with the war over and outlook improving, it should be a good time to get away from the grind and look over the situation. Get the other fellow's viewpoint and see how better results can be obtained in working out the problems arising out of the termination of the war.

Should Get Together

There is no place like a convention for getting together and talking over the problems of the trade. One of the great troubles with merchants in general is that they have a tendency to keep apart instead of pulling together. It is only by getting together and hearing what the other fellow's problems are, and how he gets around difficulties, that you can solve your own. There are many big problems that affect the whole trade. Matters of this kind can be threshed out at such a gathering as that in Montreal, and recommendations can be made that will be of benefit to the whole trade.

Apart from all this, every sanitary and heating engineer has a duty toward the trade. If he can help make better conditions it is his duty to do it. It has been proven by actual experience that the quickest and most effective way of benefiting the trade is through associations. If every member takes an active part, tremendous results can be accomplished.

Indications are that the convention will contain all the good features of previous sessions, and that several new ones will be added with a view of giving visible and practical demonstrations of how to handle important matters. There will be addresses by men who are in the closest possible touch with various phases of the plumbing and heating trades. They will discuss business conditions, the trade outlook, prospects of market conditions, prices and other points of keen interest to the members of the trade.

Should Come Prepared

Everyone should come prepared to make notes of everything that may interest them. There will be so many points coming up continually through the sessions, which will apply to the business of each individual, that unless he comes prepared with pad and pencil to make notes right at the time, he will miss many valuable suggestions. It is useless to try to trust to one's memory on an occasion of this kind. The only way to do is to make notes, and then they can be referred to afterwards and the whole subject may be recalled.

A gathering like that which is to be held in Montreal on June 3 and 4, affords a real opportunity that no man in the trade can afford to miss. The points that he will pick up in regard to conducting his business will alone repay him for the trip.

The conditions likely to prevail in the future regarding markets and prices is a vital one. The chance of meeting the other men and hearing them discuss their problems is worth while in itself. More valuable experience can be picked up in a short time in this way than the average merchant would gather in any other way in years. It is the men who are face to face with the business problems who can tell just what they have had to meet and how they met it. Many dealers have been surprised to find that the problems mentioned were often the very ones that they had been puzzling over and trying to figure out.

In writing of the objects of the Canadian Society of Domestic Sanitary and Heating Engineers, John Watson, the secretary, extends also an invitation. His letter reproduced in the April 1 issue of SANITARY ENGINEER read in part as follows:

"We are holding our Annual Convention in Montreal on the 3rd and 4th of June and would be pleased to have any of our craft who are legitimately carrying on the business of plumbing and heating at this meeting. We would much prefer that you establish a society in your city or town and then send some delegates to the convention, but if preferred any individual can join up with our society at a cost of one dollar for this year, all that is required is a letter from you on your letterhead paper making application for membership. We will then send you a copy of our by-laws and if you approve of our method of doing business the cost of same will be one dollar per member, which pays your capitation tax up to the Annual Con-

vention. Hoping you will seriously consider this matter as it is of vital importance to all in our business."

The more members any association has, the more powerful will be its influence, and the more widely it can be exerted. It is the aim of the officers to make the organization of real value and service to all members.

Start a Local Organization

It is not expected that every plumbing and heating engineer will be able to attend. For this reason the present body urges the formation of a local body from which one representative may be sent. In speaking of the need for proper organization so that sanitary and heating engineers may work together to uphold their trade in the problems of the day, J. E. Walsh, Montreal, the vice-president of the Canadian body, has this to say:

"What are sanitary and heating engineers doing to further the cause of demobilization? Are they, like other associations, strengthening their ranks and preparing themselves to take their proper places in the universal reconstruction? The question must be answered by the individual. Are you a member of a local organization? Or, if there is no organization in your locality, are you endeavoring to do your share in forming one? If there exists an association in your city or town, do you not feel that the present demands for co-operation leave you no choice but to seek membership? And if an association does not exist in your neighborhood, do you not realize that you must become willing, even anxious to co-operate with your confreres in forming one? In either case the remedy is simple.

Get Assistance Here

"In the large cities of every Province there are sanitary and heating associations, whose members are only too pleased to add to their numbers, as well as to assist smaller cities and towns in forming similar organizations. Some Provinces, moreover, are fully organized as Provinces. Ontario and Saskatchewan are the leaders in that respect and their members openly acknowledge that, to their organizations, they owe the prosperity and efficiency of their trades. The city of Toronto, in the opinion of many, boasts the most thoroughly organized and modernized society. Its genial and energetic secretary, Garrett Frankland, makes it both a pleasure and a duty to extend to fellow craftsmen of his own or other Provinces the benefits of his experience, and is at all times prepared to supply them with any literature or advice tending to encourage and assist in the establishment of locals.

"The city of Montreal has, likewise, a splendid association, whose president, T. Latourelle, and secretary, John A. Gordon, are only too happy to be of assistance to the sanitary and heating engineers of other towns and cities."

The advantage of men in the same section of trade getting together, meeting one another, and talking over matters of mutual interest, cannot be overestimated. It engenders a spirit of co-operation throughout the whole trade, which makes for beter conditions and better business. The effects are not only immediate, but permanent. It is something like dropping a stone in a pond. The circle is ever-widening, and in this case it is an ever-widening circle for the good of the trade. While good results immediately from gatherings such as will be held in Montreal, the benefits are spread over months or even years.

CONVENTION BRIEFS

Remember the date, June 3 and 4.

* * *

It will be in Montreal.

* * *

John Watson, 4145 St. Catherine St., Westmount, Montreal, is the Secretary.

* * *

Discussions are carried on in both French and English.

* * *

Make it a hummer!

* * *

Get together—It's good business.

* * *

You may have the solution of the other fellow's problem—he may have a solution of yours. You both benefit from meeting at Montreal.

MONTREAL APPOINTS CONVENTION DELEGATES

At the last meeting of the Montreal Master Plumbers, delegates were appointed to the June convention to be held in Montreal. The names of these are: H. Lavigueur, P. C. Ogilvie, D. A. Bethune, Telesphore Latourelle, James Ballantyne, Jos. Belisle, John A. Gordon. These are the accredited delegates of the association.

That the visiting delegates may be looked after, an entertainment committee was appointed and the personnel of this is: James Griffin, convenor; Walter Ryan, George Delaney, Mr. Lepine, and Arthur Noel. With this strong committee under Mr. Griffin, it is assured that the visitors will be made very welcome and that they will be well looked after.

During the open season for navigation, Montreal harbor is one of the busiest spots in the world. This shows a small section of the harbor with several ocean-going vessels loading and discharging freight.

Ontario Housing Committee Report

Standard Specifications Drawn Up—Permits and Licenses—Excavating—The Plumbing Details Outlined—What is Required in Heating—Electric Wiring and Installation of Fixtures

ONTARIO HOUSING COMMITTEE SUBMITS REPORT

The report of the Ontario Housing Committee recently issued makes known many facts hitherto perhaps hinted at but not considered so general. There is a wealth of revelation upon which SANITARY ENGINEER'S *readers can base a campaign for better heating and plumbing in the homes. The opportunity is here and now—better homes mean not only good business but a better citizenship. The report herewith covers the standard specifications as related to the plumbing and heating trades*—EDITOR'S NOTE.

WHEN the Ontario Housing Committee undertook to work out various types of houses conforming to their recommendations and standards, as given in the general report, it was recognized that the full value of their suggestions would not be realized unless more or less complete working drawings and specifications were prepared, illustrating and describing various types of construction.

The committee felt that this was especially desirable in view of the fact that less than ten per cent. of inexpensive homes have the benefit of architectural supervision.

It will be readily understood that the task of preparing complete drawings illustrating all types of construction would be a very serious undertaking. The drawings, therefore, indicate general layout only, with governing dimensions, location of special items, such as plumbing fixtures, electric outlets and typical details of doors, window frames and sash and special fittings.

The specifications have been prepared as a guide in determining the general trade classification and standards of materials and workmanship. It will be noted that in the suggestions for general conditions, as well as in trade specifications, the supervision of the contract forming part of an architect's service has been delegated to the owner. This has been done for the purpose of directing the owner's notice, where an architect's services are not available, to particular items requiring attention.

Too much emphasis cannot be placed on the need and desirability of the services of a competent architect.

Where a development involving the construction of a number of dwellings is contemplated it will always be possible as well as advisable to secure the advice of an architect. The Ontario Association of Architects has expressed its willingness to co-operate in improving the design of small houses by providing drawings at a nominal cost to assist the builders of individual dwellings.

General Conditions—Permits and Licenses

The contractor for masonry shall secure all permits and licenses necessary for the execution of the entire work excepting plumbing and electrical work, and shall pay the lawful fees therefor, and the same shall be included in the contract price. This contractor shall give the proper persons all requisite or desirable notices relating to the work, except as noted above. Fees, permits and licenses for plumbing and electrical work shall be paid for and obtained by contractors for those trades.

Water Supply

Water supply shall be arranged for by the contractor for masonry, who shall obtain permits, pay fees, and install the construction water supply system, extending same to convenient points about the premises. Water rates shall be paid by this contractor throughout the progress of the work.

Excavating—Lines and Levels

The contractor for plumbing will establish lines and levels for all excavating in connection with plumbing work.

Work Included

This subdivision shall include all excavating of whatever nature required for footings, walls, piers, temporary and permanent drainage system and water supply or other piping, all baling, pumping, bracing of banks, care of pipes and conduits, all back-filling and grading to levels indicated.

Plumbing—General Conditions

The general conditions pertain to all trades and form a part of this specification and the contract, and shall be carefully read and adhered to by this contract.

Work Included

This sub-division shall include the furnishing and installing complete of all stacks, drainage, vents, service water, fixtures, etc.

Materials and Workmanship

The entire work shall be executed as described under paragraphs of description, instructions, requirements, etc., using particular materials and apparatus as specified under the following headings: Pipe and Fittings—Valves—Ferrules—Soldering Nipples—Floor, Ceiling and Partition Plates—Drains and Traps—Cleanouts—Painting—Fixtures.

Relation to Other Trades

This contractor shall confer with all other contractors whose work may affect his installation, and arrange his equipment in proper relation with the building construction and the architectural finish. Special care shall be taken in the installation of all equipment where same is to be concealed, to see that it comes within the finished lines of floors, ceilings, partitions or walls.

This contractor shall notify all other contractors of all openings, anchors, hangers, excavating or other provision necessary for the installation of his work, and shall furnish such anchors, hangers, etc., and information regarding openings and excavating in ample time, so that proper provision can be made for same. Failure to comply with this requirement on the part of this contractor will not relieve him of the cost of cutting for openings, installing anchors, hangers, etc., and excavating at a later period, and the subsequent patching, backfilling, etc., thereby required.

Certificates, Fees, Etc.

This contractor shall give all necessary notices, obtain all necessary permits, and pay all fees in order that the work hereinafter specified may be carried out, and he shall furnish any certificates necessary as evidence that the work installed conforms with the laws and regulations of the city and province in which this work is carried on.

Guarantees

This contractor shall guarantee all material and workmanship used in the work to be of the best quality obtainable in strict accordance with the specifications and free from any defects. Any defects which may appear in any of the work within the year after the acceptance, ordinary wear and tear excepted, shall be repaired and replaced by this contractor without any additional cost to the owners. Where such defects occur, this contractor shall be held responsible for all costs incurred in making the defective work good, and all injuries to plaster, wood or other finish, caused by such replacements and repairs of defective work, shall be replaced and repaired in first-class condition by this contractor at his own expense.

Description of System—Sewerage, Drainage and Waste

This system shall consist in general of a house sewer line starting at the street sewer and continued into the building under the basement floor, with running trap, fresh air vent and branches from same carrying off all sewerage, drainage and waste from all plumbing fixtures and risers, floor drains and all

other apparatus requiring drain connection. Soil and waste branches from fixtures throughout upper floors shall be connected through branch lines into risers discharging into house sewer.

Vents

Back vents shall be provided from all fixture traps, such vents to be carried to a point three (3) feet above the roof line, or joined to soil or waste stacks above the highest fixture connection. The bottom of all vent stacks shall also be joined to soil or waste stacks below the lowest fixture connection.

Service Water

A connection shall be made to the water main and run underground to a point inside the building, where a stop-cock and drip shall be installed. The line shall be continued from this point to the fixtures, including hot water boiler. From the hot water boiler a line shall be run to the sink (laundry tubs when tubs are indicated), basin and bath.

Standard Requirements—General Instructions

This contractor shall be held responsible for all measurements throughout and for any alterations necessary in the arrangement of pipes or the location of same in order to make them come within the finished lines of wall or ceiling. No pipe fittings or work of any kind shall be covered up or hidden from view before it has been examined and approved by the owner. Soil, waste and vent stacks, water leaders and water risers shall be true and plumb.

All soil or vent pipes where they pass through the roof must be properly flashed with 5-pound sheet lead or 16-ounce copper and made watertight. That portion of metal resting on roof must be at least 20 inches square, and that portion extending up pipe, if used, must be 10 inches high.

In addition to the points specified or shown, shut-off valves shall be provided wherever necessary for the proper operation of the system.

Where reductions in pipe sizes take place at fittings, reducing fittings must be used. Bushings will not be accepted.

All off-sets in soil, waste and vent stacks and lines shall be made with ⅛ bends, and any off-sets above the highest fixture shall be made at an angle not less than 45 degrees. Changes in direction shall be made by the use of proper fittings, as no screwed joints or bowed pipes will be permitted.

Connections between vertical and horizontal pipes shall be made with ⅛ and ¼ heads. Long ¼ bends and long T Y's may be used where their use is permitted by the Plumbing Regulations. Short ¼ bends, double hubs, short roof increases, straight crosses, double T's or double T Y's shall not be used on any part of the work. No branch fitting other than a full Y or Y and ⅛ bend shall be used on any soil or waste pipe running in a horizontal direction.

Lead pipe shall not be used for branches to any fixtures except the short lead connections to water closets and slop sinks.

All joints or cast iron soil pipe and fittings shall be made of packed oakum and soft molten lead well caulked. New lead shall be used in all cases for this work, and in no case shall old lead pipe and other materials be melted up and used. No putty or cement shall be used about these joints.

Cleanouts shall be provided in all sewers, soil stacks, waste and drain pipes at all points where obstructions may be formed. All such cleanouts shall be full size of pipe up to 4 inches in diameter and not less than 4 inches in diameter for larger pipes. Cleanouts shall be gas-tight and accessible.

All joints necessary in lead pipe and between lead pipe and brass fittings shall be wiped solder joints. Connections between cast iron soil pipe and lead pipe shall be made by means of cast brass ferrules and wiped solder joints, the lead pipe being extended through the ferrule, and flange turned out and up the outside of the pipe, with the wiped solder joint at the outside of the ferrule.

Connections between wrought iron and lead pipe shall be made by means of cast brass soldering nipples screwed on to wrought iron pipe and wiped solder joints.

Connections between wrought iron pipes and cast iron pipes shall be made by caulking the threaded end of the wrought iron pipe into the hub of the cast iron pipe.

Connections between wrought iron vent pipes and cast iron pipes shall be made by means of cast iron fittings with branch tapped for iron pipe size.

All joints in wrought iron pipe shall be made with screwed joints set in red lead.

Current Events in Photograph

One of the chief ambitions in life of the Bolsheviki seems to be to wreck and murder. This junk pile shows how costly locomotives were deliberately wrecked. The men on guard are British bluejackets and the scene is at Soroka, on the Murmansk-Archangel Railway. This wreckage is a very mild sample of what usually happens when the Bolsheviki are in charge of things.

Connections of brass pipe and between brass pipe and iron pipe shall be made by means of screwed joints, the threaded connections on brass pipe to be the same as iron pipe threads for pitch and taper. No slip joint couplings will be permitted on sewer side of trap. All traps shall be well supported and shall be true in respect to their water levels and shall have a seal of not less than 1½ inches. No lead traps will be allowed on any part of the work.

Drain, Soil and Waste Connections to Fixtures

All fixtures throughout shall be connected to waste, soil or drain lines, with branches and traps of not less than the following inside diameters:

Water closets	4 in.
Basins	1¼ in.
Sinks	1½ in.
Baths	1½ in.
Laundry tubs	1½ in.
Floor drains	4 in.

Vent Connections to Fixtures

Vent shall be installed for each trap throughout the work. These vent connections shall be made through branches of not less than the following diameters:

Water closets	3 in.
Basins	1¼ in.
Sinks	1¼ in.
Bath tubs	1¼ in.
Laundry tubs	1¼ in.

All branch vent connections shall be made as near the trap as possible. No trap vent pipe shall be less than four inches, inside diameter, where it passes through the roof, and all vent pipes must continue to rise after leaving the trap and pass out through the roof or connect with soil pipe above the highest fixture. Where they are required to be increased they shall be increased at a point not less than 1 foot below roof line, by means of an increase not less than 9 inches long and extended the required height above the roof line in the larger size.

Hot and Cold Water Connections to Fixtures

Branches for hot and cold water shall be provided to individual fixtures requiring water. These connections shall not be less than the following:

Supply Branches	Less than 20 lbs pressure.	More than 20 lbs. pressure.
Water closets	¾ in.	½ in.
Basins	½ in.	½ in.
Bath tubs	¾ in.	½ in.
Sinks	⅜ in.	½ in.
Laundry tubs	¾ in.	½ in.
Main supply	1 in.	¾ in.
Hose connection (if any)	1 in.	¾ in.

The branch connection from the flush tank to the W.C. bowl shall be 1¼ inch in all cases.

Service pipe shall in all cases be one size larger than the tap in the street main.

Pitch of Piping

The house drain and all horizontal lines of rainwater leaders, and all soil and waste piping, shall be graded in the direction of flow, with a pitch of not less than 1 inch in 4 feet.

All horizontal branches of vent piping shall be graded with a pitch of not less than 1 inch in 4 feet towards the fixture or fixtures to which they connect.

All horizontal branches of hot and cold water shall be so graded that they may be completely drained.

Securing of Pipes

All vertical lines of piping shall be firmly supported and held in place by iron pipe hooks or straps placed immediately below the hubs, couplings or fittings, and securely fastened to walls or floors.

Overflow for Fixtures

Suitable provision shall be made for overflows from all plumbing fixtures. and connections to such overflows shall be made in the waste lines on the fixture side of the trap.

Tests

After all drain, soil, waste, vents, hot water and cold water pipes have been placed in position and all branches installed, but before any fixtures have been set and connected, or the main house drain permanently connected to the sewer, the tightness of all joints and the soundness of all pipes shall be tested in the presence of the owner in the following manner:

Soil, Waste, Drain and Vent Pipes

All openings and pipe ends throughout the work shall be securely closed by means of approved plugs, and the entire pipe system shall be filled with water to the top of the highest opening, and this water shall stand at this same level for not less than two hours.

Another test shall be made of the entire plumbing system after the fixtures are set and the house drain connected to the sewer, this test consisting of turning the water into all pipes, fixtures and traps, in order to detect any imperfect material or workmanship.

Requirements for All Tests

If the tests as required above reveal any leaks or defects, such leaks or defects shall be repaired immediately and the tests repeated until satisfactory results are obtained. The above-mentioned tests shall not relieve this contractor from additional tests which may be required by any municipal department, under whose jurisdiction this work may come.

Standard Requirements—Pipe and Fittings

Sewer from street sewer to a point three feet outside the wall of building shall be 6 inches vitrified clay tile.

From this point all sewer, drain, soil, waste and vent pipes and fittings shall be standard weight cast iron.

Hot and Cold Water

Pipe except as provided for below grade shall be best grade, genuine wrought iron pipe, galvanized, as manufactured by . . . .

Pipe where buried underground shall be "Mark A lead pipe of size heretofore specified, weighing not less than 4 pounds 10 ounces per yard for ½ inch pipe, 9 pounds per yard for ¾ inch pipe, and 12 pounds per yard for 1 inch pipe.

Fittings exposed in toilet rooms or around in individual fixtures shall be cast brass fittings, nickel-plated or otherwise finished to conform with the finish of metal on fixtures.

Valves

Shut-off valves shall be brass of the globe pattern and shall be equal to those manufactured by. . . .

Ferrules

Ferrules shall be extra heavy cast brass, bell-shaped, and not less than four (4) inches long.

Soldering Nipples

Soldering nipples shall be of cast brass of first grade brass tubing, iron pipe size.

Floor, Ceiling, Partition Plates

Plates shall be of iron, finished for painting, and shall be used where pipes pass through floors, ceilings and partitions.

Drains and Traps

Floor drains shall be of the combined drain and trap pattern with cast iron bodies and strainers, similar to . . . 6 inches by 6 inches.

House sewer traps shall be extra heavy cast iron deep seal running traps coated with Asphaltum, with cleanouts and connections for fresh air vent.

See specifications for lavatories under "Toilet Fixtures" for fixture traps.

Cleanouts

Cleanouts shall consist of T.Y. or trap fittings, full size of the pipe up to four (4) inches in diameter and not less than four (4) inches for larger sizes. They shall be closed gas tight with extra heavy brass plugs screwed into heavy brass ferrules, caulked into the hubs of traps or fittings.

Cleanout plugs to have square nuts one (1) inch in height and one and one half (1½) inches square.

Cleanouts located below the floor shall be extended up and set flush with the finished floor.

Pipes, Fittings and Valves, Painting

All exposed pipes, fittings and valves, except where brass or nickel plated, shall be painted three (3) coats, first coat of lead and oil, and two (2) coats of graphite paint, color as directed.

All concealed pipes shall be painted one (1) coat of lead and oil.

Materials and Workmanship

Materials and workmanship as specified in the general specification for "painting" shall apply to this trade.

Fixtures

The following list of fixtures is not intended to restrict the choice of fixture to any one manufacturer. The selection is intended to suggest a standard quality and design suitable to work of this class.

All plumbing fixtures shall be in accordance with the following specifications:

Water Closets

Syphon-action bowls of an approved type, with low down oak varnished finished tanks. N.P. post hinge seat and covers, complete with brass floor flange.

Basins

18-in.x12-in. enamel iron basins, similar to plate J.R.700, with china index low down basin cks., and N.P. ⅜-in. brass supply pipes and 1¼-in. N.P. ½-in. S. trap.

Baths

5 ft. x 2½ ft. or 1¾ in. roll rim enamel baths, with china index N.P. double bath cks. Tail piece threaded for I.P. and N.P.C.W. and O.

Sinks

18 in. x 24 in. enamel roll rim sinks in one piece, with N.P. adjustable flange bibb for ½ in. I.P. and 1½ in. S. lead traps.

Range Boilers

30 gallon galvanized boilers, with 12 in. stands.

Laundry Trays

2 part cement laundry trays with plug and coupling iron stands, N.P. ½ in. compression bibbs.

Tray and Sink

Similar to F371 combination sink and laundry tray in one piece, with N.P. compression flange bibb and 1½ in. N.P. ½ S. traps to wall.

Heating, General Conditions

The general conditions pertain to all trades and form a part of this specification and the contract, and shall be carefully read and adhered to by this contractor.

Work Included

This subdivision shall consist of the furnishing and installing complete, of a gravity hot air heating system, all as herein specified, as may be required to properly complete the work.

Relations to Other Trades

This contractor shall confer with contractors for other trades and arrange his equipment in proper relation to the building construction, architectural finish, and other apparatus. Special care shall be taken in the installation where same is to be concealed, to see that it comes within the finished lines of floors, ceilings, walls or partitions.

This contractor shall notify all other contractors of all openings or other provision necessary for the installation of his work, and shall furnish such information ample time, so that proper provision can be made. Failure to comply with this requirement on the part of this contractor will not relieve him of the cost of cutting at a later period, and subsequent patching, etc., thereby required.

Certificates, Fees, etc.

This contractor shall give all necessary notices and obtain all necessary permits and pay all fees, in order that the work hereinafter specified may be carried out, and he shall furnish any certificates necessary as evidence that the work installed conforms with the laws and regulations of the city and province in which this work is carried on, and the requirements of the inspection bureau of the Canadian Fire Underwriters' Association.

Guarantee

This contractor will be required to furnish a written guarantee that the system as installed under proper management will heat the living room, dining room and bathroom to a temperature of 70 degrees F., and the bedrooms to a temperature of 65 degrees when the outside temperature is at zero.

This contractor shall also guarantee all materials and workmanship to be the best of the quality specified and free from any defects. Any defects which may appear in any of the work within one (1) year after acceptance, ordinary wear and tear excepted, shall be repaired or replaced at this contractor's expense, including all costs for patching or damage to other trades caused by such replacements.

IMPROVE THESE CONDITIONS! !

Another group of 113 houses was investigated. Small houses were more in evidence than in the first group, only two being of more than six rooms. Rooms were sub-let to roomers in 22 houses, and to families in 14. Owing to the tendency in the larger houses to sub-let it was noted that the number of persons per room increased from 1.00 in the four-room houses to 1.10 in those with six rooms. While a considerable proportion of these houses was reported to be in bad repair and insanitary, no definite statement was made as to the actual number unfit for habitation. Wet cellars were found in eight houses, in seven the roof leaked, and in four both the roof and cellar admitted water. In no case was there more than one bathroom or toilet, and 57 houses were without bathrooms, while 28 were without inside toilet. In the group of 235, only three houses (all three of the duplex type) contained more than one bathroom. There were no bathrooms in 79 houses, and in 47 cases the toilets were outside. —Extract from the Report of the Ontario Housing Committee.

Description of System

Heating shall be accomplished by means of circulated air heated by furnaces, each of at least (insert capacity required) cubic feet capacity. The heated air shall be supplied to various rooms in the most direct manner possible, through ducts and registers.

Fresh air supply shall be taken from an outside point and cold air shall be exhausted from the halls.

Sheet Metal Work

All ducts and flues shall be thoroughly stiffened and supported in place.

All pipes in basements shall be round, and where they pass through partitions or walls, shall be provided with collars.

All leaders shall be provided with dampers, and shall be tagged, indicating room it supplies.

All turns in leaders shall be made with elbows of not less than four pieces.

All stacks in partitions shall be oval or rectangular in cross section.

All hot air pipes and stacks shall be bright tin.

Cold air pipes or ducts shall be 26 gauge galvanized iron.

Furnace smoke pipe shall be 24 gauge galvanized iron.

All horizontal pipe shall have a pitch of at least 1½ in. to 1 ft.

Insulation for Stacks

All stacks shall be insulated with two (2) layers of asbestos totalling at least 1-16 in. in thickness. This asbestos shall be pasted or secured in other approved manner.

Standard Materials, Furnace

All furnaces shall be the product of a well and favorably known manufacturer.

Register Boxes and Registers

Register boxes and registers shall be provided at each outlet. They shall be floor or wall registers as indicated.

Register boxes shall have an iron frame to receive registers, and be fitted with louvres.

All registers shall be cast iron, japanned, square lattice pattern, and equal to those of . . . . manufacture.

Electric Wiring, General Conditions

The general conditions pertain to all trades and form part of this specification and contract, and shall be carefully read and adhered to by this contractor.

Extent of Work

This sub-division shall include the execution and completion of a complete system of electric wiring as hereinafter described and shown on plans together with the furnishing of all material, appliances, tools, scaffolding, apparatus and labor necessary for said execution and completion, except as otherwise stated.

Materials and Workmanship

The entire work shall be executed as described under paragraphs of instructions, requirements, etc., using particular materials as specified under the following headings:

Headings

Local switches.
Receptacles and plugs.
Plates for switches, receptacles.
Fuses.
Service boxes.

Relations to Other Trades

This contractor shall confer with all other contractors whose work may affect his installation, and he shall arrange his equipment in proper relation to the building construction and with the architectural finish. Special care shall be taken in the installation of the equipment where same is to be concealed, that it may come within the finished lines of the floor, ceiling or walls.

This contractor shall notify all other contractors of all openings, anchors or

other provisions necessary for the installation of his work, and shall furnish such information in ample time so that proper provision may be made for same. Failure to comply with this requirement on the part of this contractor shall not relieve him of the cost of cutting at a later period, and the subsequent patching, etc., and making good required.

Rules and Regulations

All work in this contract shall be done in strict accordance with the rules and regulations of the Ontario Hydro-Electric Power Commission.

Upon the completion of the work a certificate of inspection shall be obtained from the local inspector of said department. This contractor shall pay all the necessary fees connected with this work.

Location

The plans show the approximate location of all lighting outlets, but the price bid shall include the changing the location of any or all outlets to meet the exigencies of construction or design, as the owner may direct. No extras shall be allowed for such change of location, unless the distance exceeds ten (10) feet.

Description of System, Lighting

This shall be of a type to suit current available.

This system shall consist in general of the following:

Services shall in no case be run in less than ¾ in. conduit, which shall terminate immediately at the point of entrance in each house in an approved double-compartment main service box, one compartment containing the main switch and cut-out and the other the branch cut-outs, which shall provide for sufficient circuits to subdivide the outlets in the house as required by rule D, page 25, fifth edition of rules and regulations, Hydro-Electric Power Commission, and following paragraphs.

Number of Circuits

All lighting outlets in each house shall be on as few circuits as possible, but in no case on less than two. No set of lamps requiring more than 660 watts, where grouped on one fixture, or on several fixtures or pendants, shall be dependent on one cut-out.

Drop of Potential

The drop of potential from the street main to the farthest light shall in no case exceed two (2) per cent.

Standard Requirements, General Instructions

All wires and cables shall be installed in the manner known as "concealed knob and tube" work, which shall consist of wires supported by split porcelain knobs, securely screwed in place, where wires run parallel to joists or studs, and by porcelain tubes where wires pass though joists, studs, etc. Where wires are exposed they shall be encased in bushings of flexible tubing, projecting at least 3 inches beyond floor plate or bridging. All wires shall be run taut, in straight lines, parallel or perpendicular to the walls, and there shall be no kinks or slack places in the wire except where necessary to relieve bushings or joints from strain. To avoid possible strain there shall be provided a knob adjacent to each joint at each turn in the wire and adjacent to each outlet.

On vertical runs all wires shall be protected from plaster droppings by tubes which extend at least 4 inches above the horizontal timbers which have been pierced.

Tests

All wires are to be carefully tested out after building is completed and before finished floors are laid for the detection of errors in connection or derangements due to other mechanics at work in the building.

Inspection

This contractor is to conform to all rules and requirements as regards electrical inspection. He shall notify the inspector in writing before commencing the work, and shall make any and all changes or alterations in the work as may be required by the inspector without expense to the owner.

Responsibility

This contractor shall be responsible for all wires and connections until the building is complete and the work accepted.

Where more than one circuit is brought into the same outlet each shall be separated and tagged.

Outlets

Crow's foot supports shall be provided at all lighting outlets in walls or ceilings.

Wires and Cables

Wires must not be of a smaller size than No. 14 B&S gauge, except as allowed by law for fixture work and pendant cord, where No. 18 B&S gauge will be a minimum.

Standard Materials

Wherever materials are described under specific names it shall be understood that such name is only referred to as fixing a standard of their character and efficiency. All material required under this contract and specification, and the drawings referred to herein, shall be new and the best of their respective kinds. All workmanship shall be first class.

Local Switches

Local switches, unless otherwise noted, shall be push button single pole switches with mechanism mounted on a movable plug. Where two or more switches are located together they shall be installed in gang boxes. Switches shall be equal in quality to the . . . . detachable mechanism switches.

Receptacles and Plugs

Receptacles for wall or base plug shall be of the flush type with self-closed openings, and arranged so that extensions may be used with lamp sockets or plug receptacles by using adapters.

Any wall receptacle shown on drawings shall be connected to a separate circuit carried direct to the main cut-out box in the basement, and in no case shall they be attached to the lighting circuits.

Each receptacle shall be provided with a plug and an adapter. Receptacles and plugs shall be of an approved type.

Plates for Switches, Plugs, Receptacles, etc.

Each local switch and plug receptacle shall be provided with a solid brass face plate attached by means of two screws. Plates shall be provided with openings suitable to the mechanism which they conceal and shall be finished flush brass.

Fuses

A complete set of fuses shall be supplied and placed at the time of acceptance. All fuses shall be of a type as specified in the rules and regulations of the Ontario Hydro-Electric Power Commission.

Service Boxes

A service box shall be provided for each house as required by law, complete with meter loops to fit type of meter installed or required by municipality. Such box shall be equal in quality to the ——— service box.

NATURAL GAS ASSOCIATION TO BE FORMED IN CANADA

At a meeting of producers and distributors of natural gas held in Chatham some time ago, a committee was appointed to plan the organization of an association. The committee composed of P. S. Coate, manager Chatham Gas Company; W. F. James, general superintendent of the Union Natural Gas Company; R. L. Pattinson, manager General Pipe Line Company; T. P. Pinckard, president of the Windsor Gas Company, and H. L. Braden, superintendent of the Dominion Natural Gas Company, held their first meeting at Chatham, at which P. S. Coate was appointed chairman.

The committee have gone over a proposed constitution and by-laws for the new association, and an organization meeting will be held at the Tecumseh House, London, Ont., on June 18. Notices will be sent to those interested in the natural gas and oil matters in Canada.

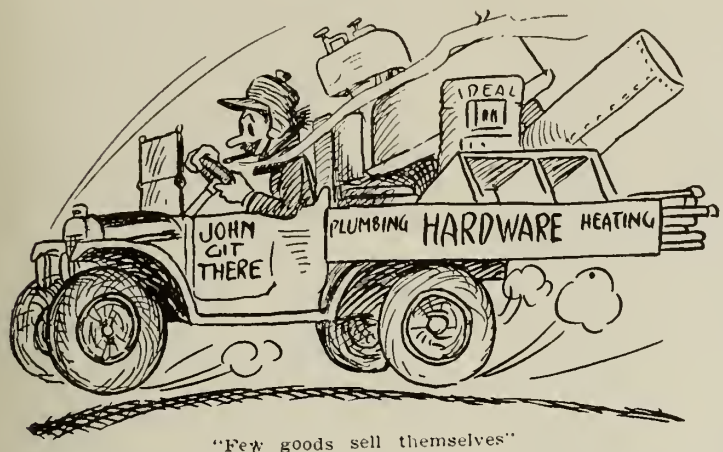
KINZINGER, BRUCE & CO., LIMITED

Catalogue "B-19," issued by Kinzinger, Bruce & Co., Limited, of Niagara Falls, Ont., contains forty pages, attractively illustrated, in which are listed the "K Niagara" lines, including soap dishes, tumbler and soap combinations, tumbler holder combinations, tumbler holders, tumbler and tooth brush combinations, tooth brush holders, sponge and soap baskets, bathroom mirrors, bathroom and robe hooks, roll holders for toilet paper, match holders and ash trays, bath seats, bathroom shelves, towel bars and racks, shower baths. Readers of SANITARY ENGINEER may obtain copies upon request.

How About Trade Expansion

Merchandise Which Sells Itself Contributes Little to Bank Balances—It is the Line Requiring Salesmanship Which Brings in the Desirable Profit

By ARTHUR HALLAM, Advertising Manager, Crane & Orderay Co., in "Hardware Trade."



"Few goods sell themselves"

VERY few goods sell themselves. The only ones that do are usually those things that are so universally used that every store carries them, and there is no profit in selling them. No merchant is fond of handling them, and only does so because he has to complete his line. Goods sold on price alone are seldom profit bringers.

It is the thing that has to be sold, that requires effort to dispose of it, which carries the comfortable margin of profit. Items like washing machines, gasoline engines, barn ventilators and equipment, and cream separators, that people feel they can get along without, do not automatically move out of your store. You have to put effort behind the sale of them. Here we see the old principle of following the line of least resistance. It is easy to sell goods that people come in and ask for, and there is a constant tendency to follow the easiest way. It has been proved by figures that few merchants make a big enough profit in proportion to the amount of capital they have invested in their business, and we believe this is one of the reasons. They are too much inclined to be satisfied with these "short profit" sales because they come easier. But the merchant who makes the money he can keep for himself is the one who pushed the "hard-to-sell" items. It is because these items are hard to sell that they carry the good profit.

All of which leads us up to the sale of plumbing and heating goods. Many people, especially in the rural districts, have gotten along very well without a central heating plant, or a complete plumbing system, and they feel that they can continue to get along without them still.

ANTICIPATE THE "BID" STAGE

Here is the whole point. Whenever you wait until a man decides of his own accord to build, he has very often already made up his mind as to what he wants. Then there is very little chance to do anything except go in and "bid" for the business, along with a number of competitors. The home builder gets so wrapped up in the price of the stuff that it is a hard proposition to get in selling talk to convince him that he ought to have more or better goods than what he has decided on.

On the other hand, if you analyze the market for plumbing and heating, you will undoubtedly find many homes and buildings only partially equipped with the different fixtures, and which are therefore prospects for more material. One reason why many merchants have not developed this business is simply for the reason that it takes time to work it up. For it is obvious that if the owner had realized the need himself for these things, he would have already bought them. This is the point where the advertising comes in. If you want to sell the owner on the idea by personal call, you will probably have to make a number of trips. Yet by sending out a series of letters to a well-selected list, you can develop the desire for the goods in the minds of your prospects to such a point that you can "close" sales after only one or two personal calls.

TAKE A CENSUS

It would not be much of a job to make a census of your territory to see what condition the heating and plumbing is in in the various buildings. You can do a little of it each day. And the beauty of this business is that when you develop it, it is yours.

No one else knows anything about it, and you don't have to cut the price way down to land the order.

How about the homes? Are they still using stoves for heating? If so, they ought to be "sold" on the idea of the advantages of a central heating plant. Do they still depend on an outdoor toilet? Then they need to be shown the advantages of a comfortable bathroom indoors. The same thing applies to home laundries. Many houses, especially those that have been built a long time, are not yet equipped with running water, laundry tubs, and floor drains in the basement. Are they still using the old flat rimmed sink, and getting their water with a pitcher spout pump? Then they need to have shown to them the labor-saving features of a handsome enameled sink and drain board, with a one-

"Then there is factory sanitation"

"The hard-to-sell goods carry the best profits"

piece back, and a small system in the basement to draw the soft water from the cistern.

TAKE A GLANCE AT THE SCHOOLS

How about the schools? Are the toilet rooms in them fit to be used by the rising generation? Are some of them still depending on dangerous and unsanitary outdoor closets? Are the lavatories and slop sinks so old that they can't be kept clean? Are all the floors supplied with bubbling fountains, so that the children can have plenty of good clean water to drink?

There is factory sanitation to be considered also, especially since so many women have lately turned to manual labor. Every community has at least one factory, and some of them several. Laboring people are growing restless, and one of the big reasons is that they do not have pleasant surroundings in which to work.

Men and women workers are entitled to cleanliness, and it is a good investment for a factory owner to provide clean, light, airy toilet, wash and dressing rooms for his employees.

MORE POSSIBILITIES

Comfort stations are another good advertisement for any city, especially if it is on a cross country highway. It is by such things that people passing through judge your city, and as they form their judgment, so will they talk about it to outsiders. The need of comfort stations, especially since saloons are becoming eliminated, has long been felt, and the plumber is surely the logical man to be interested in their development, because he will profit more than any one else.

Still another possibility is a local Y.M.C.A. or Community Club. A town of five thousand inhabitants can profitably support a Y.M.C.A., and if the town does not run that large, it can organize a Community Building. Such a building can be made a general community centre, to contain the offices of the Commercial Club, with stores on the first floor to help pay the rent, with athletic rooms in the basement, and billiard tables, lounging and committee rooms on the second floor. It often happens that an old building can be taken and remodeled for less than what an entire new building would cost. The plumber is interested in a movement of this kind, because, in addition to a good heating plant, such a building requires a generous amount of plumbing, such as bath tubs, urinals, showers, and closets, as well as a complete hot water supply system.

Another development that promises much for the future is the apartment house movement. Dwellers in the smaller communities are finding out how comfortable it is to live in quarters of this kind, so that shrewd real estate men are promoting more of these projects daily. These buildings are interesting to the plumber because they are always equipped with the most modern plumbing and heating materials.

The above are a few suggestions that can profitably be followed by any energetic merchant plumber who believes that this department of his business can be built up to a good volume of sales.

MARKET REPORTS

Continued from page 38

month, better than for some months in fact. The reduction in price has perhaps influenced the placing of some orders, but manufacturers see also in the movement an increased need for the material which all hope will continue.

Lead pipe, lb.	$0	11½
Lead waste pipe, lb.	0	12½
Lead traps and bends		15%
Lead wool, lb.	0	14
Lead sheets, 4 to 6 lbs., sq. ft., in rolls, lb.	0 10¼	0 10½
Cut sheets ½ to ¾c lb. extra and cut sheets to size, 1c lb. extra.		
Solder, guaranteed, lb.	$0 33	$0 38
Solder, strictly, lb.	0 31	0 33
Solder, commercial, lb.	0 28	0 32
Solder, wiping, lb.	0 27½	0 29½
Solder, wire, lb.	0 34	0 40
Zinc sheets, per lb.	0	17

Market in Scrap Metals Still Dull

OLD MATERIALS.—Little interest is yet markedly apparent in the situation on old materials. Dealers are not anxious to buy and there is no demand, the situation apparently hingeing on the outcome of the Peace Conference and the terms which may be made there. The steel situation in the United States is still in an unsettled state, too, and this is not tending to improve the general situation any. "Things are no worse or no better than they have been for some weeks past." That is the way the largest dealers in the district size up the situation. Dealers, however, are taking on such material as comes in at the prices shown below but they are not keen to buy. They have to take on quantities at times just to let the trade see that they are in the market for material, and sometimes in order to protect their name and credit. As a general thing they do not want to buy, even at the comparatively low figures now quoted. Some of the smaller dealers still have in mind the high figures they were receiving for their material during the years of the war, while the ultimate user has in mind the much smaller figure at which he may have to sell the articles for which he would buy scrap material. Between these two points there is a big gap, and it has not been bridged.

The steel mills and the foundries are not buying anything to speak of. In many cases they are pretty well filled up, and added to that the rate at which they are consuming material just now is much smaller than it was during the period of the war. Prices have not been changed at all during the last two weeks.

Dealers' Buying Prices—		
Tea lead	0	03
Heavy lead pipe	0	04
Pipe scrap	8	00
Stove plate, per ton	10	00
No. 2 busheling	8	00
Yellow brass	0	06
Red brass	0	08½
Light brass	0	05
Scrap zinc	0	05
Heavy copper	0	15
Wrought iron, No. 1, per gr. ton	15	00
No. 1 machinery cast	14	00
Heavy melting steel	9	00

Lower Tin Price; Lead Easier, Too

INGOT METALS.—Changes this week are confined to tin, which is down 3c, and lead, which has declined ¾c per pound. Business all the way through is considered good and present basis seems likely to hold for some little time.

COPPER.—A somewhat better tone to the market is noticeable at primary points. No quotable change is shown in price here, 18c per pound being the figure generally heard. Business is fairly good.

TIN.—A decline of 3c per pound has been recorded in this metal since the last issue, bringing the quotation down to 57c per pound. Business is fairly good.

Continued on next page

Four-Page Bulletin Has Grown to 28

Retail Merchants of Kingsville, Ont., by Close Co-operation, Have Stimulated Business—An Auction Sale Plan That Has Produced Results—Merchants Provide Auctioneer for Farmers and Then Make Cash Sales to Them.

CO-OPERATION is the keynote that has spelt success for the Kingsville Retail Merchants' Association, resulted in a great business boom for the town, and stimulated retail trade in the community to an unprecedented degree.

It was in May, 1918, that business men of the town first gathered together to discuss the concrete proposal of organization of a retailers' association. The idea originated with C. W. Hendershot, of the firm of C. W. Hendershot & Co., Ltd., who, with other merchants, realized that while Kingsville, located on the shore of Lake Erie in Essex County, was a live business centre in the warmer months, owing largely to the influx of holiday residents from Detroit and large points throughout Western Ontario, it was practically "dead" by comparison, in the colder months of the year.

Extend Sales

Originally the organization was formed merely for the purpose of co-operative advertising with the definite object of reducing expenses, and getting home to the consumer in the surrounding country the retailers' sales message. No membership fees were charged, nor has this system yet been introduced, although within the near future this course is possible, as the association increases the scope of its work.

A four-page bulletin was issued advertising special values for the first Saturday in each month, and with a circulation of 1,800 was delivered to every resident of the town by carrier boy, and to every farmer through the rural mail delivery system, within a radius of nine miles. The nearby towns of Leamington, Harrow and Essex were also thoroughly covered.

Co-operation Counts

Robert Healey, of Healey & Crawford, furniture dealers, was elected president, and W. M. Webb, of Webb's gentlemen's furnishings, was selected as secretary, and by their indefatigable efforts, supported by the enthusiastic endeavors of the other merchants, have been largely responsible for the substantial success achieved in the first twelve months of operation.

Immediate Results

Results from this spirited co-operative sales program and business stimulator were immediately noticeable. Farmers and townspeople who had seldom before visited the town began to call on the special sales days, to take advantage of the real bargains offered. Prior to each issue of the bulletin, a general meeting of the merchants was held, the campaign discussed, suggestions received and reviewed, and a canvass was made for advertisements.

ROBERT HEALEY

Kingsville, Ont., president of the Kingsville Retail Merchants' Association.

An Original Feature

Within a short time, a further original feature was introduced whereby visitors to the town were invited to bring with them goods of any description they wished to dispose of. An auctioneer was provided by the association, and a general sale conducted on the federal square in the heart of the business district, where the produce or manufactured articles, of whatever nature they might be, were sold to the highest bidder without cost to owner. No commission was charged, and everything from live stock and horses to farm produce, furniture, household furnishings and commodities of every description were bought and sold. It was literally a free exchange.

Get the Cash

Nor do these public sales militate against the regular business of the furniture dealers and other merchants. Rather the opposite was the case. With ready cash in their possession, gained from the disposal of goods which, to them, was without great value, the visitors turned their attention to actual wants that could be purchased first hand in the stores.

The regular monthly sales day and auction is now a regular feature, and the biggest business builder Kingsville has known in its history, according to the officials and members of the organization.

As is the case with every movement in its infancy, the Kingsville Co-operative Business Men's Association met with doubters and pessimists, but even the most gloomy and conservative have come to a realization of the outstanding and obvious benefits that have accrued to the business interests, and at the present time, approaching the anniversary of its birth, the organization comprises practically every live wire merchant in the town; and it is a significant fact that among its most prominent members and readiest and most enthusiastic supporters are included Messrs. C. W. Hendershot, C. A. Quick, and T. J. Salmoni, managers of the three largest stores in town, all dealing in general merchandise.

The bulletin, with a circulation of 1,800, consists of twenty-eight advertising spaces, four and a half by six inches each, which sell for three dollars an issue. No profits are turned back into the association, as the merchants participating in the campaign from month to month, buy their space at cost. They realize too, that to be successful they must offer real bargains and price reductions if the movement is to be continued and they are to gain lasting results from their association and co-operative sale program.

MARKET REPORTS

Continued from page 26

SPELTER.—Business is by no means heavy nor is it really fair, buyers being satisfied to work along pretty close to actual requirements. Stocks are not large. Price remains at 8¼c to 8½c per pound.

LEAD.—The market has eased away again and the quotations are down ¾c from the figures of last issue to 6½c per pound. Business is quite active and supplies ample.

ALUMINUM.—Conditions in this market continue quiet. Quotations nominally range around 40c per pound, with little interest shown.

ANTIMONY.—There seems to be more activity to the market at primary points and bookings for future delivery are quite plentiful. Locally there is a better feeling as a reflection of primary conditions. Price holds pretty steady at 8c per pound.

EDITORIAL COMMENT

THE VASTNESS OF POSSIBLE MARKETS

THE talk we sometimes hear about getting 100 per cent. of the trade in any given field is generally due, states *Printers' Ink*, to the inability of the ordinary mind to grasp the vastness of possible markets. The automobile business, for example, is so wonderfully successful, and the use of cars is so generally in evidence, that it is not uncommon to hear talk of saturation points. It is almost impossible to speak of any phase of the industry without using the words "millions" and "hundreds of millions." Can the layman in statistics be blamed if he believes that there cannot be much further room for expansion in the business?

For some time, indeed, it was said that the horse was on his last legs. But speculations in the decline of the horse were evidently premature. Astounding as is the development of the motor-car business, according to the *Commercial Car Journal*, no less than 85 per cent. of the United States' hauling is still done by horses. It is, therefore, likely that the horse will be with us for a while yet.

The same may be said regarding many other lines Especially is it true regarding the possibilites for sales of sanitary and heating goods. We have really not scratched the surface. There are unlimited opportunities in every community for every live merchant plumber who will analyze local conditions and needs, and who will go out after the business.

BETTERING CONDITIONS

THERE have been more reports in the past few months of firms shortening hours without reducing the pay of their employees, establishing profit-sharing plans, granting half-holidays, in some cases whole holidays, and taking similar steps, than appeared before in years. One of the changes brought about through the war is a difference in the attitude between many employers and their help. It would appear that many more changes of this kind are yet to come. England seems to be setting the pace and the rest of the world is falling into line. This process of bringing employer and employee closer together is not being accomplished without a good deal of industrial disturbance, but there seems little doubt that eventually it will work out so that there will be closer relations and harmony, that will make for better business. The question of bringing capital and labor together has been a big one for some time, but more progress is being made in solving it now than for a long time. One of the most encouraging factors in all that is being accomplished is the distinct tendency to make for better living conditions, better home life and more education. All these have been badly needed, especially in many of the big industrial centres. One of the best things the workers in England are doing is the gradual elimination of slum districts and the establishment of workers' villages where living conditions are in many instances almost ideal.

THE STEEL SITUATION

BECAUSE of the effects it will have on other business the steel situation in the United States is being watched with keen interest by thousands of merchants and manufacturers. The attitude that appears to have been adopted recently, that of not being particularly anxious to do business, is causing a good deal of comment. The steel firms have been very hard at work for some time, driven to capacity very often. They have made a great deal of money and some producers are reported to hold the view that if buyers are not anxious to do business at the lower prices recently quoted, the steel men can very well afford to wait until the public is ready to buy again and spend the time in putting their plants in shape. This idea, if carried out will, in the view of many, increase the problems of reconstruction rather than help solve it by the effects it will have on other business and especially upon investors. The investor does not need to rush into new ventures especially with so many offerings of Government bonds and securities. Just what might happen between the time the steel men reduced production to a minimum and got their plants going on a regular schedule again is very difficult to predict, but if other businesses were compelled to more or less adopt the same policy the general situation would not be improved any.

NEED PRACTICAL MEN

A COMMUNICATION from the Canadian Mission in London to the Canadian Trade Commission in Ottawa emphasizes the difficulties faced there in promptly securing business for Dominion firms unless these are represented on the spot by practical men acting for groups of industries or otherwise. Time is of importance in all the reconstruction orders now being undertaken in Europe, and the Mis-

sion states that business is invariably lost when they are compelled to cable for prices, descriptions or samples. There is keen competition for all the trade offering, and the Mission points out plainly that firms not prepared to be represented singly or by groups cannot expect to book orders. It would be a benefit to business men forming groups to bid for this export trade if they notify the Canadian Trade Commission.

CONDITIONS THAT FAVOR BUSINESS

THERE was a tendency following the signing of the armistice to hold back—to wait for prices to drop; merchants all over were conservative. Some to-day are sitting away back in their offices telling people things are quiet and prices must come down and missing the chance of their lives to move their stocks.

There is business within reach of the aggressive merchant—the farmer was never so prosperous—there are some retailers creating sales records this spring. Read what W. J. Carter, of Carter Bros., Picton, Ont., writes in the course of a letter recently received:

"Business is fine, and has every appearance of keeping up. The farmers are getting enormous prices for their calves and hogs. When the latter went to 18c last year, it was thought the utmost price had been reached, but they were paid 21½ cents here last Saturday. In the old days they would realize $4 or $5 for a month old calf, now they get $23.00. One farmer got $476.00 for four head of cattle last week. Verily, the farmers' lines are falling in pleasant places these days."

Isn't there some reason here to believe conditions should be good with the merchant? Are you out in the sunshine or glooming away back in the office where every day is dull? "Business is fine"—are you getting your share?

THE livest, biggest retail merchants are constantly on the watch for new ideas. Salesmanship is one of the greatest things in the world.

THINK of business in broader terms than your own store, your own street and your own house. All merchants have common problems and by getting together and deciding on a common basis of action they can usually solve them. Co-operation not only counts in business but it makes broader-gauged men.

SHORTER working hours and higher wages seems to be a popular demand all over the world just now.

IT IS no use advertising unless you have the goods, and no use having the goods unless you advertise.

WHAT OTHER EDITORS SAY

SECRETARY REDFIELD'S scheme to stabilize commodity prices on a lower level, through moral suasion exercised by an industrial board of review, is of no practical value. It was easy enough to boost prices during the war to stimulate production, and even to stop profiteering when one had a club to swing, but it is an entirely different matter to argue with a man that he should lower the prices of his wares just because you think they are too high, no matter how much justification there may be for your opinion.

The law of supply and demand, if it is allowed free scope, is the best regulator of prices.—New York *Globe*.

* * *

NO merchant nor town official who spends every year all that he can afford with the home paper—whether that expenditure is actually necessary or not—makes a wiser, more profitable investment. Some think they are giving the home paper something. On the contrary, the paper is earning every cent it gets and more—provided it is a paper worth picking up in the road. And if it isn't that sort of paper, it is usually the fault of the town in which it is published.

The average weekly editor usually has his all invested in his newspaper property. The investment generally represents from two to five thousand dollars. But it is worth more to a town than five times the amount invested in any other local enterprise. As a rule the newspaper represents to the outside world the town itself. Poor paper, poor town is the usual verdict. It is therefore to the interest of every town to support a good newspaper.—*The Canadian*, Parry Sound, Ont.

* * *

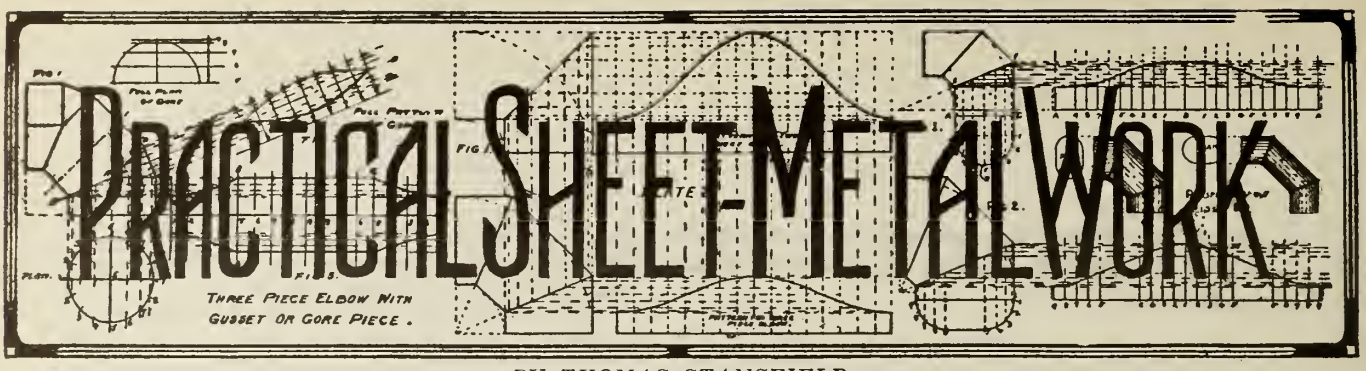
IT seems not to be certain that the plan for stabilizing prices is absolutely abandoned, so far as iron and steel products are involved in the restoration of industrial and trade activities. It is a matter of special interest on account of the exceptional condition of industry and trade on many lines at a time of such extensive readjustment as has been made necessary for getting back to peace conditions. In ordinary time of production and trade, conditions of demand and supply will of themselves work out the process of stabilizing, whether on a lower or a higher level.

The trouble now is that on many lines industry and trade were so put out of joint by the utterly exceptional war conditions that they cannot get back in the normal manner without a good deal of delay and of uncertainty in the movement on many lines.—*Journal of Commerce*, New York.

* * *

THE reason steel prices stay up is that the leaders in the trade are not hopeful that a large demand would result from a sharp lowering of prices. The term commonly used for such an attitude is "pessimistic" but the word is not appropriate, since it refers to temperament rather than judgment. The leaders feel that there is more money to be made by maintaining prices and squeezing out the last ton possible from existing contracts, at the same time receiving such orders as must be placed irrespective of prices, than by opening the market, negotiating with prospective buyers and finding the level at which they will take hold. Obviously it is of no particular consequence what level prices would reach in a decline, if the demand were strong enough to bring about an advancing market afterwards, for the steel trade must depend on averages, and when a dip in prices causes an upturn the tonnage sold at the lowest level is almost negligible.

Many men whose normal duty it is to sell steel do not hold to this view. They would prefer to see an open market, and chafe under the present restraint. They feel that if there were an open market the results in the long run would be satisfactory.—*The American Metal Market.*



BY THOMAS STANSFIELD

EDITOR'S NOTE.—Many letters have been received from retailers stating that the series of articles by Thos. Stanfield, on sheet metal work, have been of inestimable value to them. A large number of merchants have clipped the articles as they appeared, and have the complete series. Following is Article No. 44 of the series.

THE following article describes a method of pattern developing not taken up before. It might be termed shop practice, because of the fact that it shows how short methods can be followed, and, instead of developing the pattern on paper, it can be developed right on the sheet of metal from which the elbows are to be made. In plate 44 will be seen a handy article called a mitre plate, which, if prepared and kept on hand, can be used to advantage.

Before taking up the subject, it should be stated that every tinshop should have a good sized protractor, a steel T square. This can be easily made where there is a brake handy.

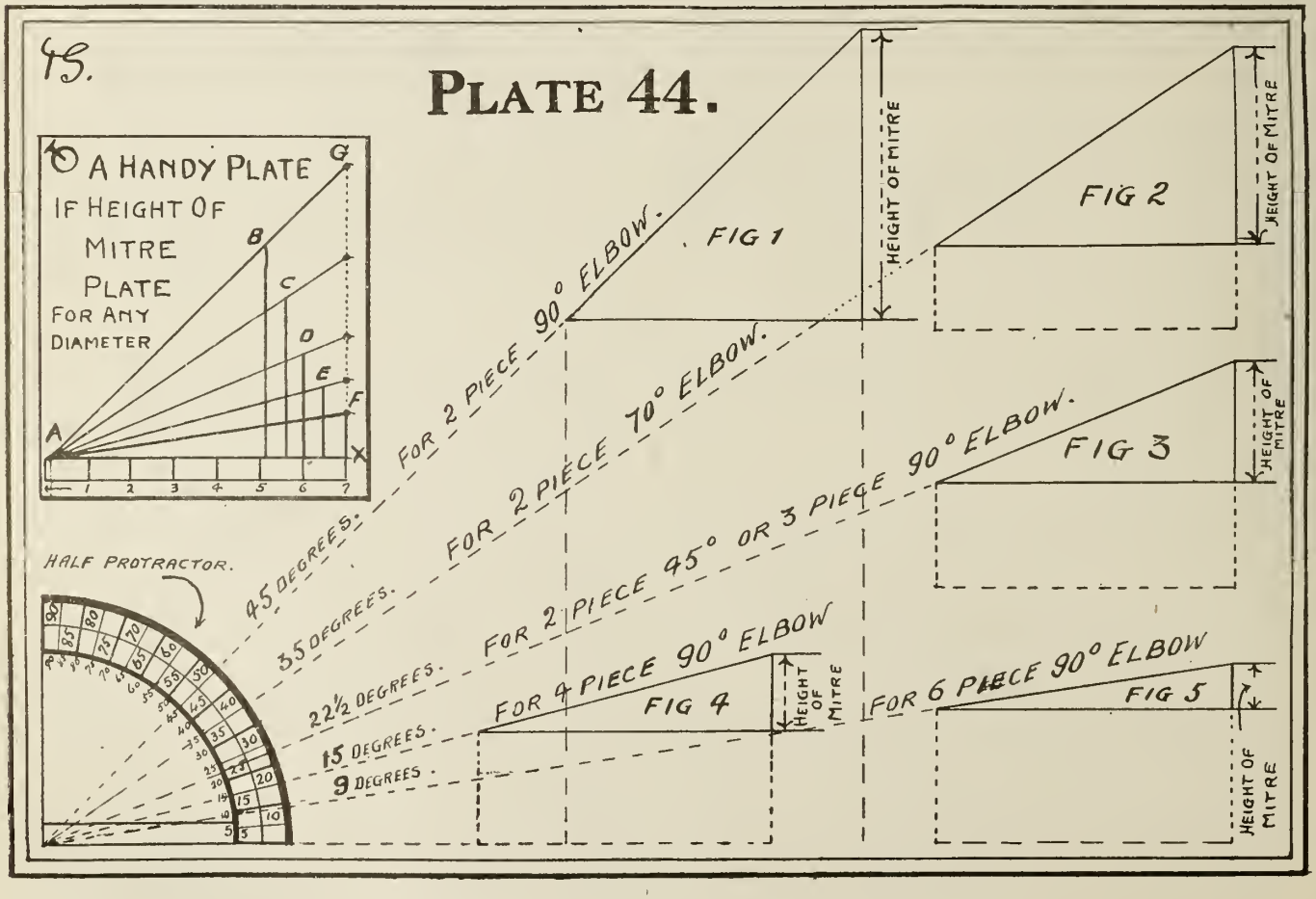
While this article simply treats with standard sized, or rather mitred elbows, the method can be adopted when developing any angle of elbow or offset.

Let us first assume that the pattern for a 2-piece, 90-degree elbow, and the diameter is, say, 3 inches, the mitre line will be 45 degress, and the height of the mitre will be the same height as the diameter.

Now add any length of line required for the depth of the throat, as shown on plate 45, Fig. 1. It will be noted that the curve of the pattern begins at the point where the throat begins.

Now, turn again to plate 44, and note how the protractor is used. Place the straight edge of the protractor against the edge of the T square and, with the 90 degree point in line with a perpendicular line, mark off the angle required. Seeing that a 90 degree, 2-piece elbow pattern, as well as a 2-piece 45 degree. or 3-piece, 90 degree elbow is described, we will develop those mitre lines used, and shown in plate 45.

It will be seen that the height of the mitre lines only is shown in plate 44, but no mention of the diameters is made. Now, turn to the "Handy Plate." The longest mitre is for a 90 degree, 2-piece



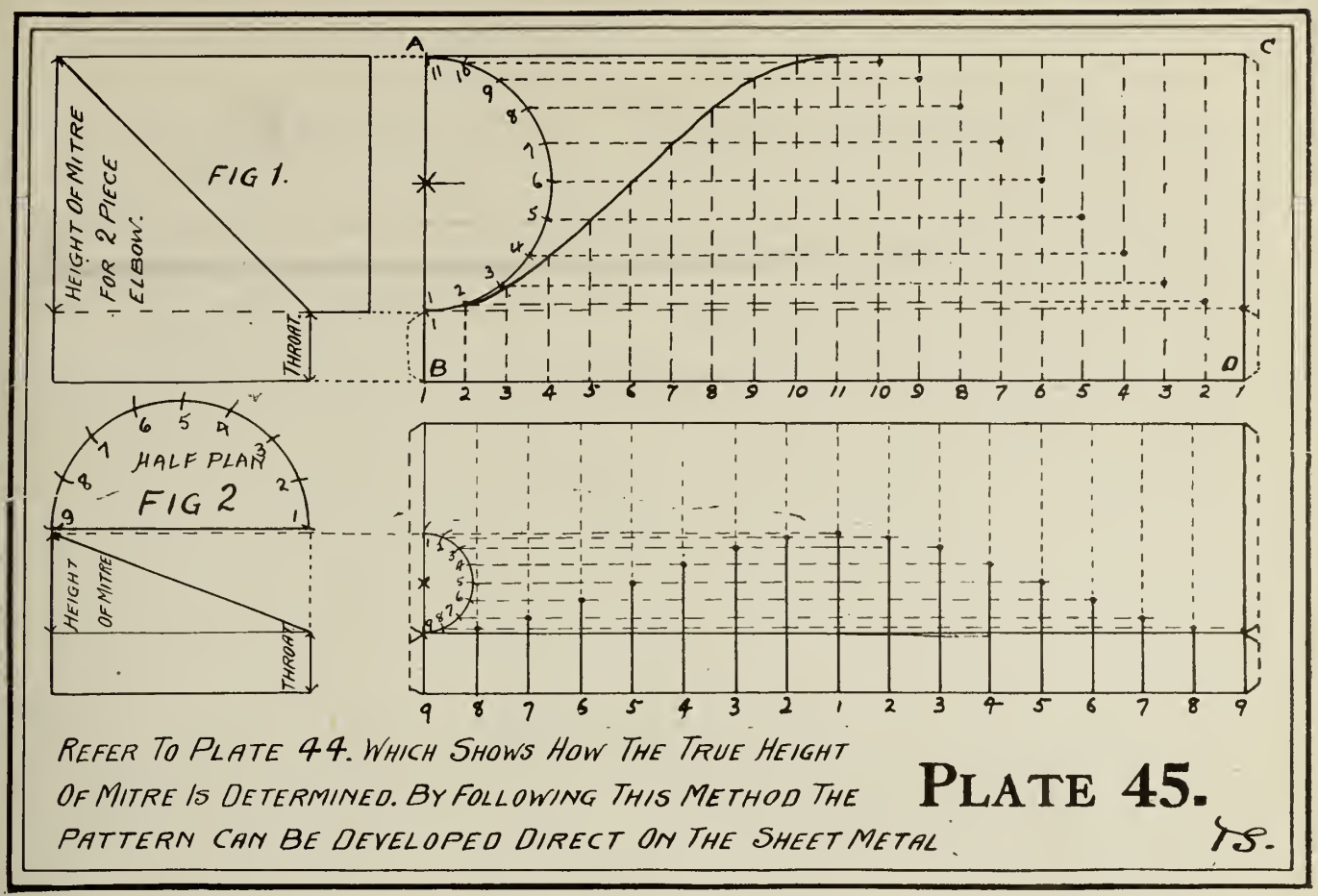


FIG 1.
HEIGHT OF MITRE FOR 2 PIECE ELBOW.
THROAT
A
B
C
D
HALF PLAN
FIG 2
HEIGHT OF MITRE
THROAT
REFER TO PLATE 44. WHICH SHOWS HOW THE TRUE HEIGHT OF MITRE IS DETERMINED. BY FOLLOWING THIS METHOD THE PATTERN CAN BE DEVELOPED DIRECT ON THE SHEET METAL
PLATE 45.

elbow, which is shown as being 7 inches in diameter; but suppose an elbow 4 inches diameter is required, the point of the compass is placed at A and opened to 4 and by drawing a line at right angles with line A and line X cutting line AG in the same manner as at B, the correct height of the mitre is procured.

The same course is followed if a 2-piece 45 degree, or 3-piece 90 degree elbow is required, by way of proving the accuracy in heights of the various mitres, measure the different ones, Figs. 1, 2, 3, 4, and 5 in plate 44, with the diameters and heights of mitres shown on the "Handy Plate."

Now turn to plate 45. Fig. 1 represents the diameter and height of mitre for a 3-inch, 2-piece, 90 degree elbow. It will be noted that the mitre is 45 degrees. We will now assume that ABCD is a piece of sheet metal and 1. B. 1. is the length of the throat, while 1. 11. A. is the height of the mitre. With point of compass at X draw a half circle and divided into any even number of equal parts as shown, 1, 2, 3 to 11, viz., 10 parts.

Now, divide the sheet with the measurements procured, beginning at 1.B. to 11, and from 11 to 1. D. and from each of these points draw a vertical line and intersect these lines by drawing horizontal lines from the points 1, 2, 3, 4 to 11 on the half circle ending at each correspondingly numbered vertical line, after cutting through the first of each line bearing the same number. It will be noted that only a part of the pattern outline is drawn, the rest is simply dotted where the vertical and horizontal lines cross. The curve shows how to cut with the snips; the dots are in practice really punch holes, so that in cutting with the snips the various points can more easily be followed.

Fig. 2 is a very similar problem except that it shows how the pattern for a 45 degree, 2-piece, or 90 degree, 3-piece elbow is developed of the same diameter as Fig. 1. On account of the mitre being less slanted, which would require too many lines being drawn horizontally across the piece of sheet metal, the half circle is divided into few parts.

It will be noted that while the height of the mitre for Fig. 1 is the same as the diameter, the half circle also represents a true half plan, but such is not the case in Fig. 2. The true height of the mitre in Fig. 2 is, however, the diameter of the half circle and by dividing the smaller into eight equal parts, the position of the horizontal lines is determined. But to find a true circumference which must represent the length of material required, it is necessary to draw a half plan.

It will be seen in this pattern that vertical solid lines are drawn to meet the horizontal lines and that dots are shown. By cutting from one dotted section to another, the material for two pieces is procured, from which a two-piece, 45 degree elbow can be made.

(Continued in next issue).

HOW TO SOLDER ZINC

Most Failures Due to Overheating Metal—Cleanliness a Requisite

"While it may not be generally recognized that sheet zinc, now so much used as a material for commercial work, is one of the easiest metals to solder, this fact is, nevertheless, true," says W. H. Hendricks, general sales engineer of the New Jersey Zinc Company. "Experienced operators claim that zinc is the most easily soldered of all sheet metals. Like anything else, however, in order to obtain good results, it is necessary that the operator be familiar with his work.

"Most failures in the attempt to secure joints of the desired length and quality where sheet zinc is concerned, are due to overheating the metal. This may occur from too long an application of the soldering iron or due to its being over-heated. As in similar operations on tin, other details also contribute to obtaining the highest efficiency in the work, but these can be easily mastered by any workman who is familiar with the general operation.

"Only a quick pass of the soldering iron over the metal is necessary to pro-

(Continued on page 35)

Heating and Ventilating

THE CHIMNEY

Third Article of Series Prepared for Readers of the "Sanitary Engineer" by N. A. Kearns

Editor's Note.—This article is the third of a series prepared especially for the readers of SANITARY ENGINEER, covering heating and engineering practice reduced to its simplest terms. Readers will find this article on the "Chimney" a most interesting and illuminative one. The first article of the series appeared in the April 1 issue. Descriptions of installations made in different classes of buildings will be given, together with the method used in making the designs for these installations. It is not our purpose to give complicated formulas, but rather to present the simple rules that have been based on these formulas, in such a way that the reader will be enabled to design a heating and ventilating system without having to refer to the data given in engineers' hand-books. The author of these articles, Mr. N. A. Kearns, has designed heating and ventilating equipment for all classes of buildings in practically every province of the Dominion. Some of the buildings were such that the heating and ventilating equipment had to be installed under the most adverse conditions, whereas in other buildings the design for the heating and ventilating equipment was incorporated in the constructional drawings. The fourth article of the series will appear in the next issue.

ALTHOUGH the chimney is one of the most vital parts of the heating plant, the chimney is seldom supplied by the party installing the balance of the apparatus. And if the heating contractor should complain of the faulty flue the owner of the building is sure that the heating contractor is working hard to provide an "alibi" for the poor work that is being done on the radiators.

Perhaps the reader might be able to explain why the worst kicker in the world will not kick at his chimney, nor at the man that built it. While everything else in connection with his building is a disappointment he is sure that the flue is all right. "His architect was no good, and it was necessary for Mrs. —— to practically design the house herself. Everything that appears to be right was designed by Mrs. ——, but that everything that is wrong was designed by the architect. Just look at the heating—look at those radiators under the windows—why we can't keep our curtains off them. I wanted them over on the inside walls out of the way, but the heating contractor went right ahead and put them in there and said that that is where the plans showed them and where he contracted to put them." And thus the householder goes on without a limit until he comes to mention his chimney. Then he no longer knocks, but becomes wildly enthusiastic about the wonderful man he had building his chimneys. He states that that man knows more about the building of chimneys and about the bricking-in of boilers than any other individual in the whole world. The man is a flue specialist and does nothing but build flues. He has been called in to consult with all of the leading scientists and it was only as a very special favor on account of some family connection that this owner managed to get this specialist to build his flue.

This picture is not a shade overdrawn. The reader must know from experience that nine-tenths of heating troubles are due to poor chimneys, but when you mention that fact to the average building owner he feels deeply insulted that any doubt should be cast on that dear friend of his—the chimney.

You may find nothing new in this article dealing with flues. So much has been written and so much talk has been wasted in trying to bring us all to a better understanding of the importance of the flues that one might be justified in believing that the subject had been exhausted. Perhaps it is not that we are ignorant of what a flue should be, but because of the blind worship that property owners give their chimney that we find it so difficult to get flues built in accordance with true scientific principles.

Now do not think because a building contractor is building for himself that the flue in his building is bound to be right. And if you are fortunate enough to get the contract for heating before the flue has been erected, be sure and watch that flue while it is being built. To show how much care is required in this connection we may quote of one case here in Toronto where the architect's plans show a flue 17 in. square. The flue as built was 17 in. square at the bottom and 17 in. square at the top, and for two seasons the owner condemned the boiler connected to that flue. The boiler manufacturers contending that the flue was at fault, and the owner persisting in the statement that the flue was all right, and just before a lawsuit was instituted by one of the parties interested the flue was opened and found to be 12 in. x 17 in. at a point 16 feet from the top. The bricklayer that had built that flue had already made an affidavit that the flue was 17 in. square throughout.

Over in Rosedale there is a large house that was built by one of the best known contractors in Canada for his own use. He afterwards sold that house, and the writer had occasion to examine the premises. We found that the flue to which the boiler was connected also served for two fireplaces, and those fireplaces had no dampers in them. This contractor insisted that the flews were not built according to our report, but he never could find time to come and see those flues for himself. The fireplace connections into the boiler flue were quite visible from the throat of either fireplace.

If the plan shows a flue of a certain size it is no indication that the flue actually built is of that size. Bricklayers are never so happy as when they are permitted to ignore a plan. They evidently believe that a plan showing a flue as being 17 in. x 17 in. or approximately that size does not mean anything of the kind but rather 23 in. by 23 in., or 13 in. by 13 in., or perhaps a sort of a composite of all of these sizes.

There is no man who has been in any way connected with the heating business for any length of time that does not know of scores of examples such as the above. The writer has actually seen

flues that were completely stopped up with brick and mortar while the owner was spending many uncomfortable hours trying to get a fire to burn in the boiler.

Be sure to see that the flue is high enough to establish the necessary draft. The draft, or the speed of the gas travel, through the flue, varies with the height of the flue, and the difference in the temperature of the gases in the flue and the temperature of the surrounding atmosphere.

It is usually assumed that in the ordinary flue with the temperature of the gases at about 500 degrees, the weight of the gas is about half that of the surrounding atmosphere at 60 degrees, thus, with this difference in weight the natural law of the pressure of a heavier weight counterbalancing the lighter comes into effect and the pressure of the heavy column of cold air pushes the lighter column of gas out of the chimney. If we assume a chimney 60 feet high we can consider that we have a column of 60 feet of unheated air that is to be used as a force in driving gas out of the chimney. Thus it follows that by increasing the height of the chimney we increase the height or weight of the counterbalancing force, thereby speeding up the draft, or we might put a fire in the flue and by raising the temperature of the flue gases induce a strong draft in this way. So now with these facts in our possession we know that if a flue is not high enough to establish the proper draft conditions fuel must be wasted to heat the flue so as to secure the necessary draft.

The standard draft condition for combustion in the ordinary heating boiler corresponds with the force necessary to raise one square inch of water two-tenths of an inch. Most heating boilers are built on the assumption that the flue to which they are to be connected will draw that much, so when you refer to the manufacturers' catalogue and find that a hot-water boiler with a capacity of 1,400 feet requires a 12 in. flue when the flue is only 30 feet high you must not assume that a flue 10 in. square will be good enough because the smoke collar on the boiler is only 10 in. in diameter. You must bear in mind that the 10 in. collar was based on a flue 60 feet high, and if you must use a flue 10 in. square it should be at least 60 feet in height. Most manufacturers' catalogues give us the chimney sizes required for their boilers, and it has been found that the best results with any type of boiler have been obtained where the flue has been of sufficient height to permit an area not greater than the diameter of the smoke collar on the boiler. Take good care to see that the flue is high enough.

If the top of the flue is at the same height as or below some of its surroundings it is sure to be subject to down drafts or horizontal air curls. If the flue is high enough for the proper draft (60 feet or more) and if difficulty is to be experienced in building the flue higher, down drafts may be prevented by the hooding of the flue. For illustration: A flue comes up on the west side of the building next to a lane. On the other side of the lane there is a much higher building, and when the wind is blowing from the east or west the chimney is subject to down drafts. To "hood" this a slab is placed right over the top of the chimney, and openings are cut below the slab on the north and south sides of the flue. Each of these two openings must be the same area as the flue.

In referring to the height of a flue we mean that measurement taken from the level of the grate in the heating apparatus to the top of the flue. It does not matter where the smoke pipe enters the flue, the height of the flue is always relative to the height of the grate.

A flue may be so large in area that it is impossible for the flue gases coming from a slow combustion boiler to supply heat sufficient to create the necessary draft. This condition is generally found where flues have been built for soft coal boilers and anthracite burning boilers have been installed. In this case the area of the flue should be reduced at the top, and the reduction should not be made at an angle of less than 60 degrees with the horizontal.

The writer prefers a straight, square brick flue, with struck joints and not plastered inside. When flues are plastered inside the plaster often falls out, pulling the mortar out of the joints and leaving air leaks in the walls. When tile or terra cotta pipes are used for flues, their joints are not always cemented tight enough to prevent the escape of gas from the flue or the leakage of air to the flue.

If two flues run up in the same chimney be sure to see that they are not connected together either in the cleanout chamber below or in the flue above the smoke collar. Be sure that there are no leaks in the partition between the flues. flues.

If a cleanout is built in the flue see that its door fits tightly. The cleanout should be on the inside of the basement and not on the outside as found on many residences. The door must be below the level of the smoke pipe opening.

See that the flue is not offset to make room for a fire place, or offset to avoid a joist, a beam or rafter.

If the chimney is built of stone see that the flue is lined with brick.

See that the smoke pipe does not go in too far, and that the thimble in the flue is tight, and that the smoke pipe fits into place without air leaks. See that all dampers swing freely, and if there is an automatic damper installed see that it is hanging properly.

See that there is enough air coming into the boiler room for proper combustion.

To save a great many heating troubles "watch the flue."

OUTLOOK GENERALLY SHOWS IMPROVEMENT

(Continued from page 12)

Another Manufacturer's Views of Outlook

Another manufacturer discussing the situation blamed the daily newspapers for creating in the minds of the public the idea that prices are high.

"The newspapers," he said, "are to blame for a lot of building being held up. They are inconsistent in their argument by urging that wages remain high and prices of commodities brought down. It can't be done. Building materials, relatively speaking, are low in price. They have not made anything like the advances that other things have. Take building materials and compare the advances made between them and farm products for instance. Pine lumber went up $20 per thousand feet, that in cold figures is an advance of 36 per cent. The wages of masons advanced 12 cents an hour or 22 per cent. Carpenters are getting 15 cents an hour more or an advance of 37½ per cent. Portland cement advanced in price approximately 54½ per cent. Now contrast these advances with some others. Between January, 1914, and January, 1919, wheat advanced 163 per cent. in Winnipeg and 149 per cent. in Toronto. Creamery butter at Montreal went up 86 per cent., hogs at Toronto were 84 per cent. higher, washed wool in Toronto was quoted at an advance of 196 per cent., and choice butcher's cattle 80 per cent. higher. In Montreal cheese went up 79 per cent. These are merely a few commodities that everyone knows about, and will bear out what I say, that speaking relatively, building costs are not high.

Aggressive Tactics Needed

"As far as the trade is concerned my view is that the plumbers do not go after business agressively. They are content, in the great majority of cases, to take what offers. Take Toronto for instance. There are 95,000 homes, and in fully ten per cent. of these dwellings the bathrooms should be taken out and new ones put in. It is up to the plumbers to do this. They can get the business if they go after it. They can take a leaf out of the book of the piano firms. They do not wait for the people to come into the store and buy. They go out and sell to the people. I am satisfied that the plumbers can do the same thing but they don't do it. Every woman likes to have a nice bathroom in her home and takes a pride in it if she has one. In too many homes, however, there is old plumbing and fixtures, and the woman has no encouragement to make the bathroom the equal of any of the other rooms. In homes where there are nice bathroom fixtures the woman takes as much pride in the bathroom as she does in the parlor. There is a big chance here for the plumbers to get a lot of business but, they must go after it."

HAMILTON MAY LICENSE PLUMBERS

At a meeting of the Hamilton, Ont., Police Commissioners held on April 30, the Civic Plumbing Inspector asked that a by-law be passed licensing plumbers, both masters and journeymen. He explained that this system had worked out very satisfactorily in Toronto and other places and would enable him to give better supervision to the work that was being done. The commissioners seemed to be favorable, and it was agreed that the city solicitor should be instructed to prepare a by-law for the next meeting.

News from Here and There

CONTRIBUTIONS OF NEWS GLADLY ACCEPTED

BUSINESS CHANGES

W. J. Cowie has opened a shop in Colborne, Ont., where he will conduct a plumbing and heating business.

R. Linnett, plumber and tinsmith, formerly of Brandon, Man., has opened an establishment at Indian Head, Sask.

The partnership between T. N. Meyer and his son, J. E. Meyer, who were in the plumbing, heating and sheet metal business under the name of T. N. Meyer & Son, of Neustadt and Ayton, Ont., has been dissolved. T. N. Meyer will retain the Neustadt end of the business, while his son is assuming control at Ayton.

CONVENTION IN CLEVELAND

The fourteenth annual meeting of the Natural Gas Association of America will be held at Cleveland, May 20, 21, 22.

NOTES OF THE TRADE

William Randall, for the past 31 years in the service of the Toronto Waterworks Department, as superintendent of maintenance and distribution, is leaving the city's service to become managing director for Canada of the Neptune Meter Co., of New York, who are establishing a branch plant in Toronto. Mr. Randall has done some very valuable work for the city, especially during the intake trouble some years ago, and he is regarded by Toronto civic officials as a man whom it will be very difficult to replace.

TRACTOR CO. LOCATE IN TORONTO

The Chase Tractor Co., with headquarters at Detroit, Mich., have opened a Canadian branch at Toronto. For the present the company will be located in the old Cluff Bros. munition plant on Atlantic Avenue, but later plan on securing a site at the Eastern Harbor terminal.

HOUSING IN WINNIPEG

Houses are so scarce in Winnipeg that even houses pronounced unfit for human habitation are being repaired and rented. The sanitary inspectors have to work continuously to ensure that the sanitary regulations are followed in any measure. The renting agencies are responsible for putting a house into proper shape, and as a general rule they do it, but often they do not, and then it is up to the sanitary inspector to make them. One family were unable to get any water for a week after they moved into their house. The water had been left turned on in many houses during the winter when they were unoccupied and the water pipes froze and burst. There is ice in the kitchens and bathrooms but the houses are being rented just the same. It is stated by the Winnipeg "Telegram" that up to the present the Federal housing scheme has deterred private enterprise from building houses as it would be competing against cheap Government money.

PUBLIC HEALTH ACT AMENDED

The Ontario Legislature which is at present in session has passed an amendment to the Public Health Act providing that when a city council orders the installation of sanitary conveniences in a house not so equipped it shall, through its clerk, be obliged to make an affidavit of the cost of such installations and the location of the property so assessed. When the tax has been paid a like certificate, stating that fact, shall be registered by the city clerk.

Among many other privileges granted to the City of Toronto by the Ontario Legislature, is that they are given the power to levy and collect against land annexed to the city, rates for the cost of any sewer constructed within the city before these lands were annexed in cases where the sewer benefits the lands.

GETTING READY FOR CONVENTION

Secretary Watson of the C.S.D.S. and H. Engineers, is a busy man these days. Between the onerous duties of his office in arranging matters for the June convention and the increase of spring work there is little spare time. "This strike," said Mr. Watson, "has not helped any. Why, some of our friends have even asked us to move their trunks for them, and we have done so. Then others want their gas stoves moved by our truck, and this is not so bad, it gives them an idea where to get these goods."

It is scarcely a regular thing to ask the plumber to move baggage, but his readiness to fill in at such a time but indicates the good-natured and well-intentioned servant that he ever is. Hurrah for the Dominion secretary!

The executive committee of the Canadian Society Domestic Sanitary and Heating Engineers met on Friday, April 25. Secretary Watson reports that encouragement is already coming in from the Quebec plumbers in particular. Applications have been sifting in for membership, and this means that interest in the work is being awakened, and that augurs well for a better convention. Every member should do his best to place this convention head and shoulders above any that have yet been held, thinks the executive. Individual effort should be exerted to the limit to be productive of the better results. Combined, they will mean a big force and make for success.

At this meeting, the entertainment committee, Jas. Griffin, chairman, conferred with the executive, and plans are well in hand, it is understood, for suitable entertainment of the visiting delegates.

THE PRESIDENT'S DESK

Since his death in the year 1900 the desk of the late James Robertson, founder of the James Robertson Co., Ltd., has been kept in his office, just as it was in the lifetime of this active executive, whose business was founded in 1857.

In the above year, the late Mr. Robertson came to Canada to establish a branch for an old English firm, manufacturing white lead, colors, lead pipe, and sheet lead. Eventually, Mr. Robertson purchased the business of the firm he came to Canada to establish. One of his first purchases in the way of office furniture was that of a massive office desk made of walnut. This, naturally, had many special associations for him as the years passed, and was much prized by him. After his decease, the desk was not removed from office. The association of the desk with the late Mr. Robertson's executive life was so close that the officers have retained it in its original condition and location, as if waiting to perform still, the bidding of its old associate.

CIVIC COMMISSION WANTS ADVICE OF MASTER PLUMBERS

The Administrative Commission of the City of Montreal paid a deserved tribute to the plumbing trade when they asked the Montreal Master Plumbers' Association to appoint a committee of three to act in an advisory capacity in connection with the framing of the new Montreal Building By-laws. These are very extensive and cover a very wide field. Naturally, there is no feature of these laws which is more important and of greater consideration from the citizens' standpoint, than that of sanitation and heating. It will, therefore, be gratifying to the plumbers that their advice has been sought in this way.

While the new by-laws, as far as

plumbing and sanitation are concerned, have been in preparation for a long time, after full consideration it seems to have been wise to postpone them a little longer that they may be complete. Covering all building requirements, the plumbing by-laws, though about completed now, will have to be held over until the whole draft is ready to receive the assent of the administration. The new by-laws will, it is now stated, be operative on and after January 1st, 1920.

OPPORCHUNITY

As the pote says,
"Opporchunity knocks at ivry man's dure wanst.
On some men's dures it hammers
Till it breaks down the dure
An' thin it goes in and wakes him up
If he's asleep,
An' ever afterward it works for him
As a night-watchman.
On other men's dures it knocks and runs away,
An' on the dures iv some men it knocks
An' whin they come out
It hits them over the head with an ax.
But ivrywan has an opporchunity."

MAKING YOUR ADVERTISING WORK

(Continued from page 17)

Quality and Personality

There should be also a quality appeal on which you could direct attention to the goods that you have to sell. There is also the personal appeal, and this is illustrated quite well in an ad. which has come to the writer's attention. This merchant, who terms himself a sanitary and heating engineer and electrical dealer and contractor, has this to say under the heading of "Wiring Times": "I have on hand a large stock of wiring material, fittings, etc., and with a practical mechanical experience of twenty-four years, wiring being a part of it for the past fifteen years, and having certificates which might be seen at my shop for the technical part of it, those entrusting me with work in my line are assured of especially good service." Now here is where he clinches the point: "Which do you prefer, an experienced mechanic or a novice?" There is just a point there which may be of interest to the average sanitary and heating engineer. Those directing the interest of the various concerns are usually men who have had experience extending perhaps over quite a number of years and have made a special study of their field. This is something which from time to time it might be well to bring before those whom you would serve. Experience is a great teacher, and the fact that you have devoted a lot of time to studying the requirements and perhaps the special needs of your own community is something which your customers might well want to know. This could be worked in every few weeks, or there might be a line carried in each ad. stating that the work will be done by one whose experience will be a guarantee of satisfactory service.

Get Your Newspaper Man Working

One might go on preaching on the wisdom of newspaper advertising but it is not with the desire to preach that this article is written. Experience proves that there is real benefit to be derived from the proper use of newspaper space. This being the case it would be well for those who have not followed up their advertising very closely to see what could be done to develop their advertising. Get in touch with the local newspaper man and see what he has to suggest. You are an experienced engineer, he should be experienced in the matter of display for your advertising. The two of you should be able to work together to advantage and with this idea in mind a successful campaign could probably be mapped out. There is nothing like starting now, because when these things are put off the delay may extend over months instead of the next day which you had expected. Prosperity is apparent all around, and there is no reason why the sanitary and heating engineers should not be sharing in it as extensively as others. One means of helping may be by using your local paper and preparing convincing copy.

HOW TO SOLDER ZINC

(Continued from page 31)

duce a very stable joint. Otherwise, the zinc is either melted or its internal structure becomes changed by the overheating, with a resultant weakening of the metal, a condition that frequently produces this complaint.

Iron Must Not Be Too Hot

"Quite important it is to know that sheet zinc melts at a temperature of 419 degrees centigrade, or 786 degrees Fahrenheit. It should also be remembered that, unlike in the soldering of tin, the best results are obtained by using a soldering iron that has not become so hot as to become dull red in color. Too often the mistake of heating the iron to a dull red before applying occurs and becomes a factor in preventing a good job. Less than 500 degrees centigrade, or 932 degrees Fahrenheit, is necessary in getting the iron to the proper heat to solder joints, when sheet zinc is utilized, by the quick application above referred to.

"Cut Acid" Solution Necessary

"It is customary to use half and half solder and with its intelligent application excellent work can be accomplished. Preceding the actual operation, however, a 'cut acid' fluxing solution, or solution of zinc chloride acidulated with muriatic acid, should be applied to the metal being prepared for the work.

Cleanliness a Requisite

"As is true of other metals, care should be observed to insure the sheet zinc being first free from dirt or grease, particularly along the line to be soldered, and customary precautions should be taken in making sure that the seam surfaces are in perfect contact. These details are essential in the successful soldering of any metal whether it happens to be zinc, or tin, or possible other materials of the non-ferrous field.

"Contrary to the prevalent idea among some metal workers, the successful soldering of zinc is one that need neither be feared nor shunned because of the supposition that the work is hard to accomplish. By observing the above details the operation is simple and necessitates the use of very little solder.

"Modern automatic soldering machinery has been installed in various plants where a large number of zinc articles are made. These have lessened to a marked degree the difficulties that were once thought to beset those who derive their livelihood from working this metal, but the hand method gives equally satisfactory results when employed by experienced workmen."

MAINTAINING QUALITY

Continued from page 13

as reasonably as they can, and then stand by their figures.

Bright and Attractive

The firm's show rooms, while not large or elaborate, have a decided advantage in being bright and attractive. Full advantage is taken of this to make an effective display. It is a part of the plan followed by the firm to change its displays from time to time, and this has been found to produce good results. The firm has a large display window, which was installed when it moved to its new quarters, and the various lines are kept well before the general public. In the centre of the display room is a desk and chair for the convenience of customers. It has been frequently found that patrons of the firm wish to sit down and look through various lists or go over plans or discuss with a salesman points regarding the goods, or about an installation, and that the simple measure of providing a chair and table was much appreciated.

Prompt Delivery

Immediately adjoining the show rooms is the office and the accountant in charge can quickly give information that is required. At the rear of the building are located the workshops and store rooms. In the store rooms a complete stock is carried, so that any work can be promptly undertaken. Another feature of the service rendered to customers is a motor car and truck. Noble and Rich have found this an indispensable feature in connection with the development of their business and a means of reducing their costs of operating as well as speeding up delivery.

Noble and Rich are close readers of SANITARY ENGINEER. They not only read it themselves, but they strongly encourage their employees to read it and keep in touch with all that is doing in the trade and the development and improvements in methods.

Market Conditions and Tendencies

STATEMENTS REGARDING SUPPLIES AND TREND OF PRICES

THE MARKETS AT A GLANCE

LOWER prices are again in evidence on galvanized sheets, amounting to about 45c per 100 pounds. An important change in respect to differentials and extras has also become operative. The revision in the differential between 10¾ oz. and 28 gauge has been increased 10c, making it now 40c. It is noted also that on 10¾ oz. and 28 gauge sheets, shipped 3 feet wide, that an extra of 20c per 100 pounds over 30 inch widths is now effective. Jobbers report splendid business being handled and anticipate present scale of prices should further increase volume of orders.

Ingot metals show some changes, tin declining 3c per pound and lead coming down ¾c per pound. There is a fair amount of business being handled and the same is true of other metals as well. The easier feeling in tin and lead are responsible for declines which have been named on solder, prices on this commodity coming down from 2c to 3c per pound.

A further change is noted in new prices adopted on boiler tubes this week. The present scale of quotations is not considered so much in the light of a market change as a readjustment from the many revisions undertaken during the past months. Jobbers indicate that the present scale of quotations has been determined upon from actual costs and it will be noted that some sizes show declines with others showing slight advances.

There have been some further revisions in the price of valves, declines being in order in new scale of discounts issued. Other lines of brass goods hold at changes recently put into effect. Steam goods are selling quite freely and trade seems satisfied with volume of business.

TORONTO, April 29.—A steadier tone to the market is noticeable this week, changes being comparatively light when viewed in the light of those made in the last issue. Some changes in prices on galvanized sheets have been made and lower quotations are noted on tin and lead. Boiler tube prices have been adjusted and the new basis is now said to be in line with costs and it is expected will remain steady for some little time.

Prices Hold On Range Boiler

RANGE BOILERS.—The market is holding at unchanged levels during the week. The demand is within rather a narrow compass at the present time but that it may improve seems to be the general feeling. Trade as a whole is better and this is being reflected to some extent in this line.

Range Boilers	Standard	Extra Heavy
30-gallon	$12 25	$14 50
35-gallon	15 00	17 00
40-gallon	18 00	20 00
52-gallon	24 00	28 00
66-gallon	33 00	38 00
82-gallon	40 00	47 00
100-gallon	50 00	58 00

Enamelware Holds In Steady Position

ENAMELWARE.—The market remains in a steady and unchanged position this week with apparently no immediate change contemplated. Some interests feel that prices should ease away somewhat and that better business conditions would result from such a move. There is little moving to the trade just now.

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Basins, flat back, 14 x 15 in.	6 00
Do., corner, 15 in.	5 95
Sinks, roll rim, 18 x 30 in.	15 05
Sinks, flat rim, 20 x 30	6 47 6 35
Do., 18 x 30	5 62 5 50
Do., 18 x 24	5 12 5 00
Do., 16 x 24	4 92 4 80
Do., 14 x 20	4 25 ....
Closets, oak tank and seat	25 50
Do., enamel iron or white vitro tank	27 50

Soil Pipe and Fittings Holding Firm

SOIL PIPE FITTINGS.—The market on soil pipe is steady and firm at recent declines named and manufacturers report a fair demand developing. The volume of orders is not so large, there being apparently a tendency to send in orders often and for smaller quantities. Malleable and cast iron pipe fittings show no further revision from the figures named last week.

SOIL PIPE AND FITTINGS

Medium and extra heavy soil pipe, 2, 3 5 and 6 in.	20%
Medium and extra heavy soil pipe, 4 in.	25%
Medium and extra heavy soil pipe, 2 in. to 6 in.	35%
8 in. extra heavy pipe and fittings	15%

C. I. PIPE FITTINGS

Cast iron fittings	20%
Plugs	35%
Bushings	35%
Unions, standard	50%
Dart unions, ¼-inch to 2-inch	25%
Do., 2½-inch and larger	15%
Nipples, up to 4-inch	60%
Do., 4½-inch and larger	50%
Do., running thread 4-in. and under	30%
Couplings, 4-in. and under	40%
Do., 4½-in. and larger	20%

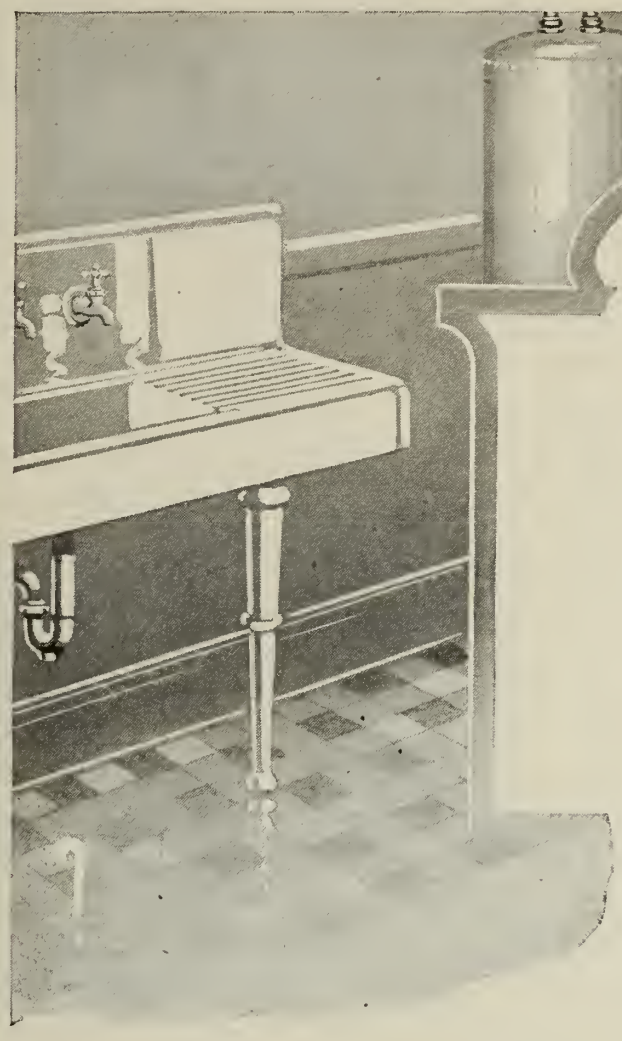
MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittings, Class A, lb.	$0 50	$0 60
Do., Class B, lb. net	0 22	0 30
Do., Class C, lb. net	0 14	0 21

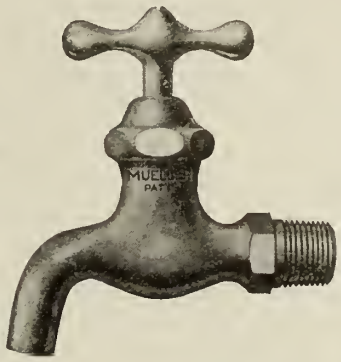
Some Further Changes in Valves

VALVES.—There have been some further changes made in valves this week following that noted in the last issue. Standard globe, angle and check valves are being quoted at 23 per cent. discount from list; with removable disc, 22 per cent.; standard gate valves, 35 per cent., and standard radiator valves, 31 per cent. Other items on the list show no change from recent revisions. Steam goods are in active demand and jobbers and manufacturers report trade splendid.

Compression work, standard	50
High grade	49
Fuller work, standard	45
High grade	38
Basin cocks, No. 0 standard	40
Nos. 1 and 2	40
Bath cocks, compression	50
Bath cocks, Fuller	45
Flatway stop and waste cocks, standard.	50
High grade	47
Roundway stop and waste cocks, standard	50
High grade	47
Brass steam cocks, standard, add 10%.	
Globe, angle and check valves, standard.	23%
Do., removable disc	22%
Radiator valves, standard	31%
Do., removable disc	Net List
Basin Cocks—	
No. 0 and 1, Fuller pattern	45
Globe, angle and check valves, standard, medium pressure	23%
Radiator valves ,standard med. pressure	31%
Radiator valves, removable seat, medium pressure	25



MUELLER



Compression Sink Bibbs

SIMPLE elegance, combined with superior strength and wearing quality, is what you give your customer when you install **MUELLER** goods.

The many advantageous features of **MUELLER** compression bibbs give maximum service from the bibb as a whole. The anti-spreading device that breaks up the whirling motion of the water and the corrugated stem and handle, allowing the handle to be set at any angle without becoming loose or wobbly, are only two of these features.

MUELLER Bibbs are the best the market affords. Write for prices.

H. Mueller Mfg. Co., Limited

SARNIA CANADA

MUELLER

Market Holds On Wrought Pipe

WROUGHT PIPE.—The situation as it affects wrought pipe is unchanged this week, the revisions named and reported in the last issue of SANITARY ENGINEER being steadily maintained. Manufacturers report some business offering and are in good shape to handle same. Prices appear in full herewith:

WROUGHT PIPE

Price List No. 39, April 3, 1919

	Standard Buttweld Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
⅛ in.	$ 6 00	$ 8 00	$.....	$.....
¼ in.	4 53	6 66	5 13	7 26
⅜ in.	4 53	6 66	5 13	7 26
¾ in.	5 99	7 57	6 84	8 42
½ in.	7 53	9 66	8 68	10 81
1 in.	11 14	14 28	12 84	15 98
1¼ in.	15 07	19 32	17 37	21 62
1½ in.	18 01	23 10	20 76	25 85
2 in.	24 24	31 08	27 94	34 78
2½ in.	38 90	49 73	.....	.....
3 in.	50 87	65 03	.....	.....
3½ in.	64 86	81 88	.....	.....
4 in.	76 85	97 01	.....	.....

	Standard Lapweld Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
2 in.	$ 27 94	$ 34 78	$ 31 64	$ 38 11
2½ in.	40 66	51 48	46 51	57 33
3 in.	53 17	67 32	60 82	74 97
3½ in.	66 70	83 72	75 90	92 92
4 in.	88 00	113 00	107 00	132 00
4½ in.	89 00	113 00	107 00	132 00
5 in.	103 00	132 00	125 00	154 00
6 in.	133 00	171 00	162 00	200 00
7 in.	175 00	224 00	211 00	259 00
8L in.	184 00	235 00	221 00	273 00
8 in.	212 00	271 00	255 00	314 00
9 in.	254 00	324 00	305 00	376 00
10L in.	235 00	301 00	283 00	349 00
10 in.	303 00	387 00	365 00	449 00

Terms, 2% 30 days, approved credit.

Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Boiler Tubes Again Readjusted

BOILER TUBES.—Prices shown in the last issue on boiler tubes have been readjusted again, some sizes showing a slight downward move and others a slight upward move. Jobbers have worked out the present schedule carefully and anticipate present basis will now stand until the next general revision, which they indicate may be some months away. Prices to-day follow:

BOILER TUBES—	Per 100 feet Seamless	Lapweld
1¼ inch	$27 00	$.....
1½ inch	28 00	.....
1¾ inch	30 00	26 00
2 inch	30 00	26 00
2¼ inch	33 00	28 00
2½ inch	40 00	32 00
3 inch	46 00	38 00
3¼ inch	.....	45 00
3½ inch	56 00	42 00
4 inch	70 00	54 00

Cotton Waste Steady; Oakum Holding

COTTON WASTE, OAKUM.—There seems to be a better volume of business coming to hand on cotton waste and jobbers are quite satisfied that situation is improving. The market remained firm and unchanged during the week. A better feeling is apparent also in the trade on oakum though actual sales are confined to small quantities. However, they seem to be coming quite often, which is a good feature.

	Per 100 lbs.
Best American	$21 00 $22 00
Clipper, spun	..... 21 00
Do., unspun	..... 10 50
Plumbers' spun	..... 9 50

Sheets Showing Further Revisions

SHEETS, PLATES.—A slight readjustment has been made in some quarters on black sheets and basis now prevailing seems fairly well established. Whether price fixing will govern or open market rule is still the question with the trade, and some feel that the open market will win out. If it does, the opinion is held that quite a further substantial drop may be made to get down to absolutely rock-bottom figures, and get business moving along in large volume again.

Galvanized sheets have come in for further revision this week, prices showing a decline of about 45c per 100 pounds. The differential between 10¾-oz. and 28-ga. sheets has been changed to 40c instead of 30c. It is also to be noted that 10¾-oz. and 28-ga. sheets, when shipped in widths of 3 feet, take an extra of 20c over prices listed below. There is no differential charged on other gauges.

The trade which is coming to hand now is considered splendid, however. It isn't coming in big chunks, but it is coming often, and this indicates a good healthy condition in the trade. Jobbers are well satisfied with volume of sales.

BLACK SHEETS—	Per 100 lbs.
10 gauge	$5 00 $5 45
12 gauge	5 05 5 50
14 gauge	.... 5 10
16 gauge	.... 5 20
18-20 gauge	.... 5 80
26 gauge	.... 5 90
28 gauge	.... 6 00
3-16 inch plate	4 90 6 25
¼-inch boiler plate	4 50 5 80

Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

GALVANIZED SHEETS—	
10¾ oz.	$7 80 $8 10
U.S. 28	7 40 7 70
U.S. 26	7 10 7 40
22 and 24	6 95 7 25
18 and 20	6 80 7 10
16	6 65 6 95
12 and 14	6 50 6 80

An extra is now charged on galvanized sheets, 10¾ oz. and 28 ga., when shipped out in sheets 3 feet wide. The extra charged over prices shown above is 20c per 100 pounds. Other gauges show no change for different widths.

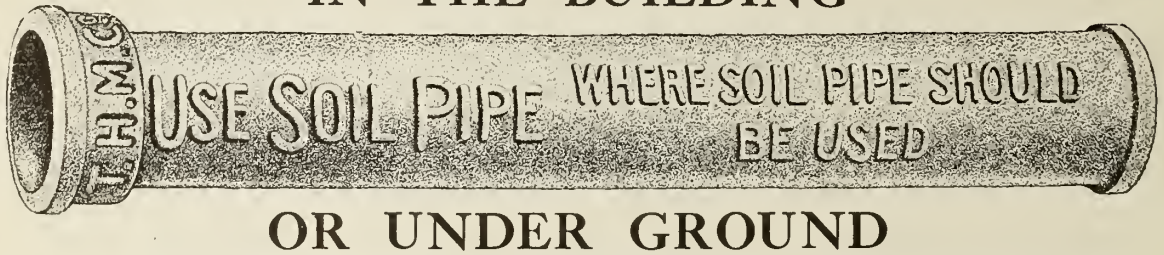
Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

Lower Prices Named on Solder

Prices during the week as applied to solder show revision downward, the decline generally amounting to about 2c per pound. On the present basis guaranteed solder is quoted at 33c to 38c per pound; strictly at 31c to 33c; commercial at 28c to 32c; wiping at 27½c to 29½c, and wire at 34c to 40c. Manufacturers report a distinct improvement in the sale of lead traps and bends in the last

Continued on page 26

IN THE BUILDING



OR UNDER GROUND

ASK YOUR JOBBER FOR T.H.M. CO. BRAND OF SOIL PIPE AND FITTINGS.

TORONTO HARDWARE MFG. COMPANY, - Toronto, Canada

WE MANUFACTURE A FULL LINE OF HIGH-GRADE RANGE BOILERS

"VALVENE" Discs (REGISTERED)

Specially prepared for Hot and Cold Water Taps. All sizes from ½ inch to 1½ inches. Soft, Pliable, and "Joint-Perfect."

Price List and Samples on Application.

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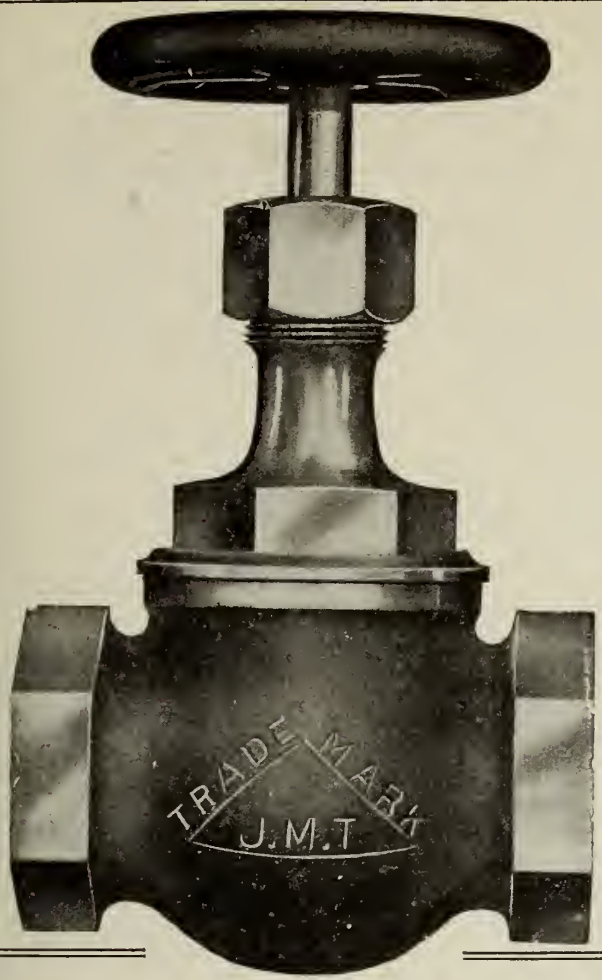

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They always satisfy the purchaser. The dealer experiences no come backs. Morrison Valves are made to last and when lasting work.

They are renewable disc valves, with heavy bodies, spindles and valves, and fitted with gland follower in packing nut.

You can sell Morrison Brass Valves in the full assurance of handling a quality product that will sustain the good reputation of your store.

The James Morrison Brass Mfg. Co. Limited

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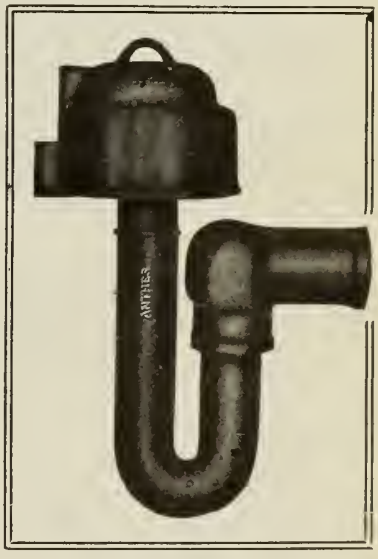
A Syphon Is The Heart Of a Sanitary Septic Tank— *Anthes Syphons Are Faultless!*



Regular and intermittent discharge in connection with the sewage system is absolutely necessary or the system installed is a failure.

Anthes Syphons and Soil pipes have no superior for permanence, quality and price.

Anthes Syphons are unconditionally guaranteed. We manufacture a full line of cast iron pipe fittings at both our plants.

Ask your jobber for "Anthes" Syphons, soil pipe and fittings.

ANTHES FOUNDRY, LIMITED

TORONTO and WINNIPEG

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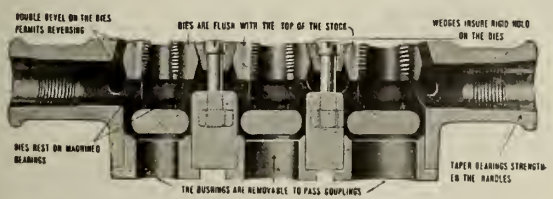
For Easy Pipe Threading
TRY THE TRIO

Simple — Compact — Complete
3 Dies in 1 Stock

The TRIO uses Little Giant Pipe Dies with the patented double bevel which permits reversing---carries the three sizes you use most frequently. TRIO is fully adjustable.

Always Ready --- Always Right
Ask for Catalogue


DOUBLE BEVEL ON THE DIES PERMITS REVERSING
DIES ARE FLUSH WITH THE TOP OF THE STOCK
WEDGES INSURE RIGID HOLD ON THE DIES
DIES REST ON MACHINED BEARINGS
TAPER BEARINGS STRENGTHENED THE HANDLES
THE BUSHINGS ARE REMOVABLE TO PASS COUPLINGS

Wells Bros. Company
of Canada, Ltd., Galt, Ontario

Canadian factory of the Greenfield
Tap and Die Corporation

First Cost *versus* Upkeep Cost!

The purchase price means nothing if the upkeep cost is not low.

The purchase price of King Boilers is no more than the average boiler and yet—

The consumption of fuel—*the upkeep cost* is lower—considerably lower.

The thin, peculiarly shaped waterways in the "King" mean quickly heated water and perfect circulation, which causes a saving in fuel because it obviates the necessity of "extra firing" to move cold water from the radiators.

The Trade should use this quick-heating, fuel-saving argument now while fuel is scarce and high in price.

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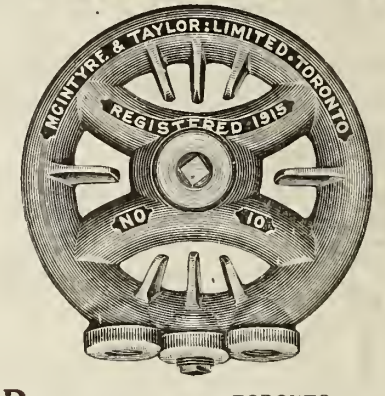
AGENCIES IN ALL LEADING CITIES

M. & T. Coils

mean that perfect circulation is procured, that liberal waterways eliminate the possibility of chokage, all of which means durability and lots of hot water.



M. & T. Coils

are made of the best grey iron, free from sand or blowholes. Every coil is properly tapped with perfect standard threads and fully guaranteed.

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SAVE YOUR COUPLINGS

Write us what you have of the various sizes, either in pieces or pounds, and we will make you a cash price on them.

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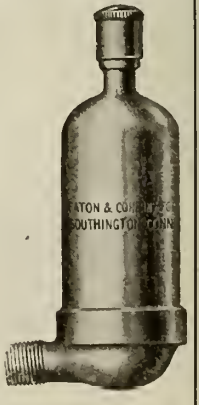
No. 1 B. & C. Automatic Radiator Air Valve

Made from the best brass with cast brass base. Screwed and soldered on, and equipped with high grade carbon. All valves tested before shipping. Use these together with our famous "B & C" Floor and Ceiling Plates and insure satisfaction.



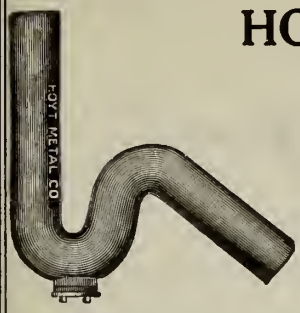
The Beaton & Corbin Mfg. Co.

Southington, Conn.

Stocks carried by our Canadian Representatives

Canadian Representative: W. H. Cunningham & Co

183 Church Street - - Toronto, Ontario



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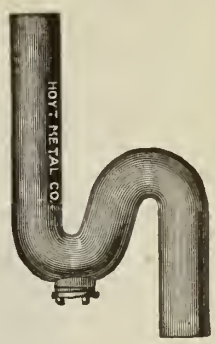
FROM COAST TO COAST

As time-savers there are none equal to our Wiping Solder, Bar or Wire Solder.

Hoyt Lead Traps, bends and waste pipe are in a class by themselves.

All our products are made to formula.



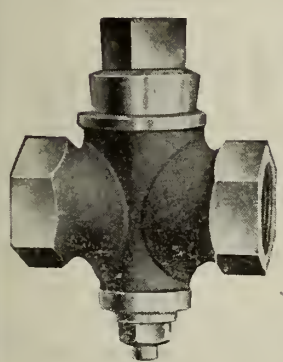
Our Mixed Metal Sales Amount To Over $5,000,000 Annually.

Write your Jobber

HOYT METAL COMPANY, TORONTO, ONTARIO

New York, N. Y., London, Eng., St. Louis, Mo.

Write Us



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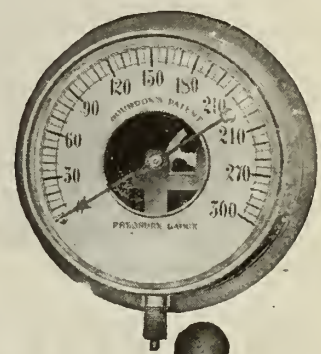
UNITED BRASSFOUNDERS AND ENGINEERS, LIMITED

EMPRESS FOUNDRY, CORNBROOK, MANCHESTER, ENG.



DURING THE WAR our Plants have been exclusively engaged on work of supreme national importance.

WITH PEACE IN SIGHT we are pleased to announce that we intend to again direct our energies to the intensive production of:—

GUNMETAL and BRASS VALVES and COCKS.
STEAM, WATER and COMPRESSED AIR FITTINGS GENERALLY.
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SEMI-ROTARY PUMPS.
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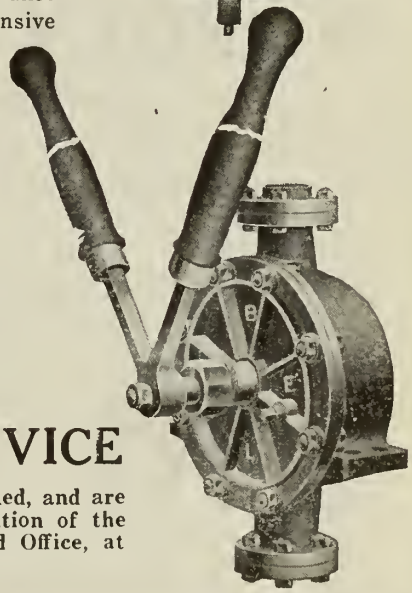
COPPERSMITHS' WORK.
"STELLA" BRAND ALLOYS: MANGANESE COPPER, SILICON COPPER, FERRO ZINC, PHOSPHOR COPPER and TIN, etc.



"UBEL" POST-WAR SERVICE

If you are interested in any or all of the lines mentioned, and are in a position to take a hand in the energetic distribution of the same, please communicate with us NOW to our Head Office, at above address.

WROUGHT PIPE

BLACK and GALVANIZED
SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

All Sizes of NIPPLES (Black and Galvanized)

Ask your jobber for CT *Brand of Wrought Pipe*

CANADIAN TUBE & IRON CO., LIMITED, MONTREAL
Works: Lachine, Can.

Over 60,000 Daisy Hot Water Boilers Now in Use Are *You* Selling Your Share?

Daisy Hot Water Boilers are easiest to sell because they have an established reputation for exactly meeting the requirements of the modern home.

Every Daisy you instal will help build bigger business by bringing repeat orders for installation in neighboring homes later.

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BRANCH OFFICE: 136 SIMCOE ST., TORONTO

Pipe Fittings

Made in Canada

NM Brand Pipe Fittings, etc., give a service and satisfaction that will invariably get you re-orders and much new business as well.

A trial of the goods will prove this claim.

CAST IRON FITTINGS

With this brand mean fittings made with iron of high tensile strength—proper proportions and correct tappings.

RECESSED DRAINAGE FITTINGS

MALLEABLE FITTINGS

With this brand mean fittings made of Air Furnace Refined Iron, reamed and tapped to gauge with perfect threads.

Standard and Extra Heavy Flanged Fittings and Flanges. Galvanizing Malleable and Gray Iron Castings of all Kinds.

International Malleable Iron Co., Limited, Guelph, Ontario, Canada

ADVERTISING INDEX

Amherst Foundry Co. ....Inside Front Cover
A. & J. Mfg. Co. 42
Anthes Foundry, Ltd. 39
Beaton & Caldwell 46
Beaton & Corbin 42
Borden Canadian Co. 48
Can. Consolidated Rubber Co. 3
Canadian Tube & Iron Co. 43
Canadian Wolverine Co. 47
Canada Metal 1
Chamberlain Desolvo Co. 46
Commercial India Rubber Co., Ltd. 38
Consumers Gas Co. 7
Consumers Metal Co. 48
Dunham, C. A. 3
Empire Manufacturing Co. ..Outside Ft. Cover
Galt Brass Co. .....Back Cover and 9
Gummer, G. & W. G., Ltd. 2
Hause Mfg. Co., Chas. F. 48
Hoyt Metal Co. 43
Imperial City Heaters 47
International Malleable Iron Co. 35
Jardine, A. B. & Co. 6
Jenkins Bros. 4
Kerr Eng. Co., Ltd. .....Inside Back Cover
Katie Foundry Co. 46
Long, R. G., & Co. 48
MacDougall & Co., R. 48
McIntyre & Taylor, Ltd. 42
Moline Heat 7
Morrison Brass Mfg. Co., Ltd., Jas. 39
Mueller Mfg. Co., H. 37
Port Hope Sanitary Mfg. Co. 10
Scaife, W. B., & Sons Co. 46
Standard Sanitary Mfg. Co. 5
Steel & Radiation, Limited 42
Trimont Manufacturing Co. 47
Toronto Hardware Mfg. Co. 38
United Brass Founders & Engineers, Ltd. Inside Back Cover
United Brass & Lead, Limited 3
Warden-King, Ltd. 44
Wallaceburg Brass Co. 6
Wells Bros. of Can., Limited 41
Williams, J. H., & Co. 45

Mark of Proof Is Proof of Quality

There's proved and certified strength in every

WILLIAMS' IMPROVED "VULCAN" CHAIN PIPE WRENCH

Each and every Flat Link Chain is "proof-tested" to two-thirds of its listed catalog strength in a standard testing machine. To each chain so tested is attached the Gray Leaden Seal, illustrated above, and every Flat Link Chain leaving our works *MUST* bear this seal—the Proof of Quality—as evidence that it has passed our standardized "proof tests."

Look for this Mark of Proof, for it is proof of Quality—it guarantees uninterrupted, severe service as well as safety to the operator. Williams' Wrenches—"Vulcan" and "Agrippa"—are the ONLY wrenches which offer this certified assurance.

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GALT - ONT.

K-T

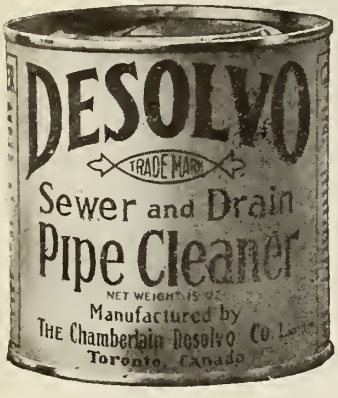
STANDARD

Soil Pipes and Fittings are of pleasing design and good finish. They look good and they **are good.**

SPECIALS

Range Boiler Stands are adjustable to 30-35-40 gallon boilers, and you can connect directly under the boiler. Inexpensive but flawless.

Your jobber can supply our goods--if you ask for them



Our customers are our biggest boosters for Desolvo. They have tried it and know it's right.

You'll Be Strong For Desolvo Too

If you just give it a trial! Desolvo and cold water will clean pipes and drains *quicker* and *cheaper* than any other way known to man.

The Chamberlain Desolvo Co.
Limited

110 Church St., Toronto

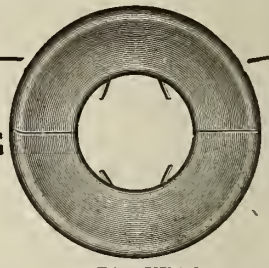
Eastern Canada Representatives

Richardson & Bureau

55 St Francis-Xavier St, Montreal, Quebec
General Offices - Pittsburg, Pa.

OPEN VIEW
NO. 10-A

The CEILING PLATE that's better



TOP VIEW
NO. 10-A

THE NO. 10—A NARROW FLANGE PLATE—IS A STEEL HINGED PLATE. FLANGES ¾" WIDE. HIGHLY FINISHED. ESPECIALLY DESIGNED FOR TWIN CONNECTION "NARROW."

Gem No. 4.

The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

High quality at the right price.

Gem No. 4 Automatic Air Valve

Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

Write for catalog showing our complete line of specialties.

The BEATON & CADWELL MANUFACTURING Co.

New Britain, Conn.

Eastern Agent: J. R. Devereux & Co., 358 Beaver Hall Square, Montreal. Western Agent: A. E. Hinds & Co., Chamber of Commerce, Winnipeg.

Steel Tanks for Every Purpose

A FEW "SCAIFE" SPECIALTIES:

Air Receivers	Filters (water)	Range Boilers
Boilers—Hot Water	Hot Water Tanks	Tanks (steel)
Expansion Tanks	Hydro-Pneumatic Tanks	Water Supply Tanks

117 years old Founded 1802

WM. B. SCAIFE & SONS CO.

New York, N.Y. Office: 26 Cortland St. Home Office: Pittsburgh, Pa.

The Wrench of 25% Greater Efficiency

TRIMO PIPE WRENCH

Two new features have been recently added to the Trimo Pipe Wrench, namely Nut-Guards, in all sizes, and unbreakable steel frames, in leading sizes.

The Nut-Guards prevent the accidental rotation of the nut while in use.

These improvements add 25% to the usefulness of the tool.

The Trimo Pipe Wrench is made with wood handles in 4 sizes, 6-in., 8-in., 10-in., 14-in. and in steel handles in all sizes, 6-in. to 48-in. inclusive.

All Trimo Pipe Wrench parts are interchangeable.

The inserted jaw in the handle can be readily replaced when worn, thus adding to the life of the tool.

Nut with Nut-Guards

Inquiries from Importers and Dealers Solicited. Send for Catalogue No. 55.

TRIMONT MANUFACTURING CO.

Cable Address: Triwrench
Code: Western Union

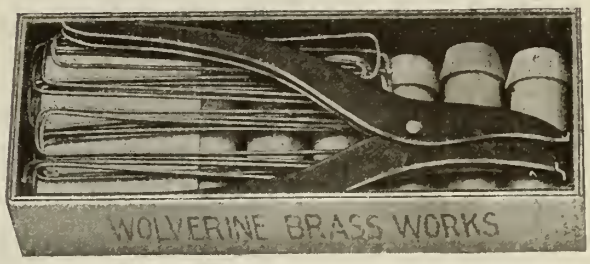
Roxbury (Boston) Mass., U.S.A.

HOSE GOODS

Why not look over your stock
NOW
and sort up on Hose Repairs?

Complete Line "C" Catalogue

No. 1774 Hose Repair Set for ¾" Hose



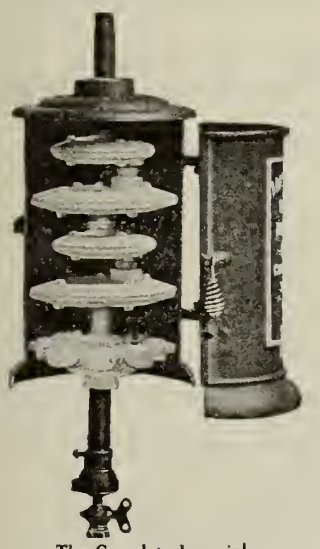
A dependable line of

PLUMBING SPECIALTIES

also at your service

Canadian Wolverine Co., Ltd.

Chatham, Ontario

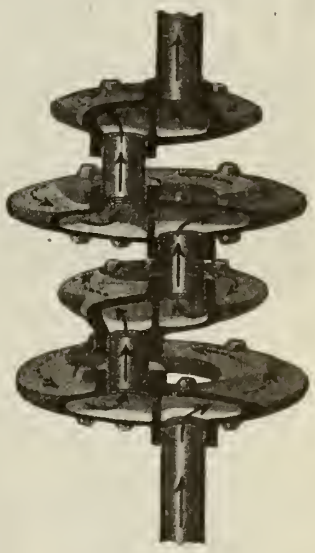


The Complete Imperial Water Heater

BY installing "IMPERIAL" heaters, you serve your customers' interests, as well as your own.

"IMPERIAL" heaters, are made in three sizes, for the ordinary, heavier, or heaviest requirements.

PERFECT HEAT baffling. Absolute water CIRCULATION.



Sectional View Showing Water Flow

POWERFUL. ECONOMICAL.

For either ARTIFICIAL or NATURAL Gas.

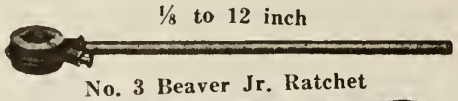
IMPERIAL CITY HEATERS, LIMITED

SARNIA, CAN.

BEAVER TOOLS

For Easy Cutting

⅛ to 12 inch



No. 3 Beaver Jr. Ratchet

THE pipe-threading problem is readily solved when **Beaver Easy-Working Die Stocks** are used. They cut quicker and save labor, time and money.

They eliminate troublesome bushings and the bother of changing dies.

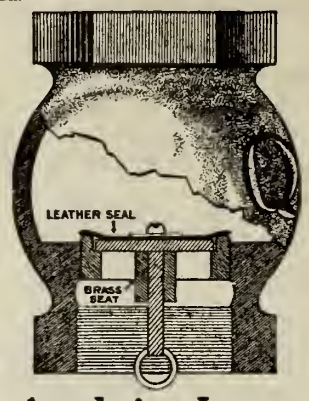
Beaver Threaders are easily adjusted. Simply "move the handle—that's all."

Beaver Tools are absolutely guaranteed. The user and the dealer are both protected.

Write us for descriptive circular and prices.

The Borden Canadian Company

110 Church St. - - - Toronto, Canada



This is a "Q" Foot Valve

And it Just *CAN'T* Leak

There are more pump troubles caused by "leaky" valves than from all the wear and tear which occurs in the average life of a pump.

The "Q" valve will overcome all priming troubles, and water once raised above it, through the suction line, will not leak out.

If you want the pumps you instal to give maximum, you will require to use the only valve on the market that JUST CAN'T LEAK.

Made in sizes from 1 to 8-inch.

R. MACDOUGALL CO., LTD.

GALT., CANADA

Chas. F. Hause Mfg. Co., Ltd.

Manufacturers of

Iron Pipe Joint Cement

SETS LIKE GUM
ALLOWS NO LEAKS

Liquid and Powder Form.

Packed in 1-lb., 5-lb., 15-lb., 25-lb., 50-lb. cans; 100 and 250-lb. barrels. Ask your jobber for prices or write us direct.

Made in Omaha, Neb., U.S.A.

Canadian Distributors:

EMPIRE MANUFACTURING CO., LIMITED

LONDON AND TORONTO

Second-Hand Pipe

1-2" to 4"

Black and Galvanized

Send us list of your requirements

Consumers Metal Company, Limited

14 St. John Street, MONTREAL

Works: LACHINE, QUE.

Plumbers' **"NATIONAL" QUALITY** *Supplies*

Lead Traps — Lead Pipe

Brass Goods

Closet Combinations

Enameled Ware — Boilers — Pipe — Fittings

UNITED BRASS & LEAD LIMITED

TORONTO, CANADA

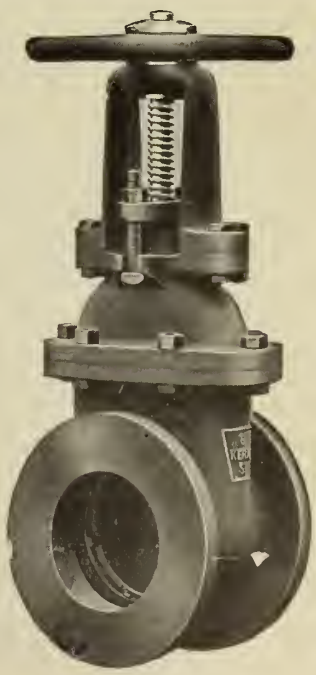
Write for a copy of our new Catalogue

There Are Lots of Gate Valves

Advertised and Sold

but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.

Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.

Approved by the Fire Underwriters' Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

A Record Performance

VitrO Tanks that were installed ten years ago are still going strong without sign of the first leak. Conclusive evidence that tank troubles are over. It pays to buy VitrO Tanks. No repairs, no leaks, all in one piece, neat in appearance and silent in operation. The tank without a lining.

Our Guarantee

A new tank will be given to replace one that at any time proves defective from either material or defective workmanship.

Write us for a VITRO

Galt Brass Company, Limited
Galt, Ontario

Sanitary Engineer

Plumber and Steamfitter of Canada

VOL. XIII. PUBLICATION OFFICE, TORONTO, MAY 15, 1919 No. 10.

Judge a Building

By Its Plumbing

THIS advice offered prospective tenants and house-buyers is sound advice.

If every prospective tenant or purchaser of a house made a thorough inspection of the sanitary arrangements in the house, instead of paying so much attention to the outside appearance, and usually so little attention to its appointments, sanitary engineers would be overwhelmed with work.

But they don't—

Therefore, it behooves the sanitary engineer to advise.

If the sanitary arrangements in his client's property is several years old—it is out-of-date. It needs replacing—or, to say the least, it greatly needs repair and replacement of parts.

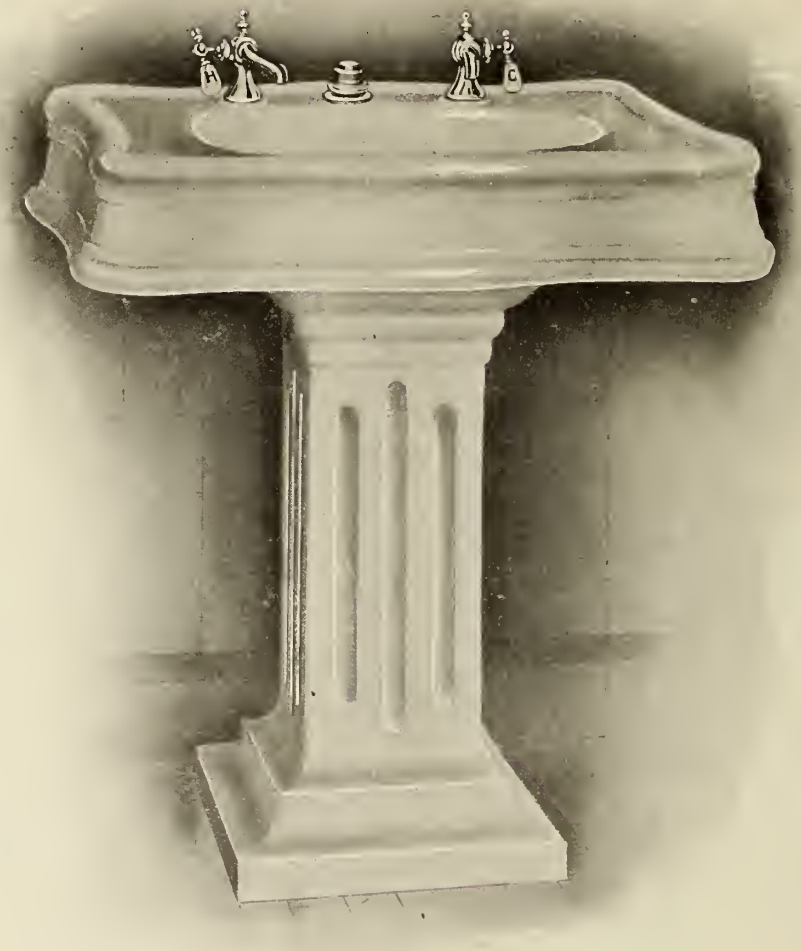
There is going to be a lot of work of this nature done this year—and the sanitary engineer should be equipped for sudden calls. He should be fully supplied with information regarding the most up-to-date appliances. He should have us at his elbow. We can be of great service to him.

Our engineers are ready to advise him. Write us and let us place our facilities, our equipment, and complete stock of everything in sanitary supplies at your disposal. It will help you greatly.

EMPIRE MANUFACTURING CO., LIMITED

LONDON AND TORONTO, CANADA

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While



A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for BEAVER BRAND CAST IRON ENAMEL WARE

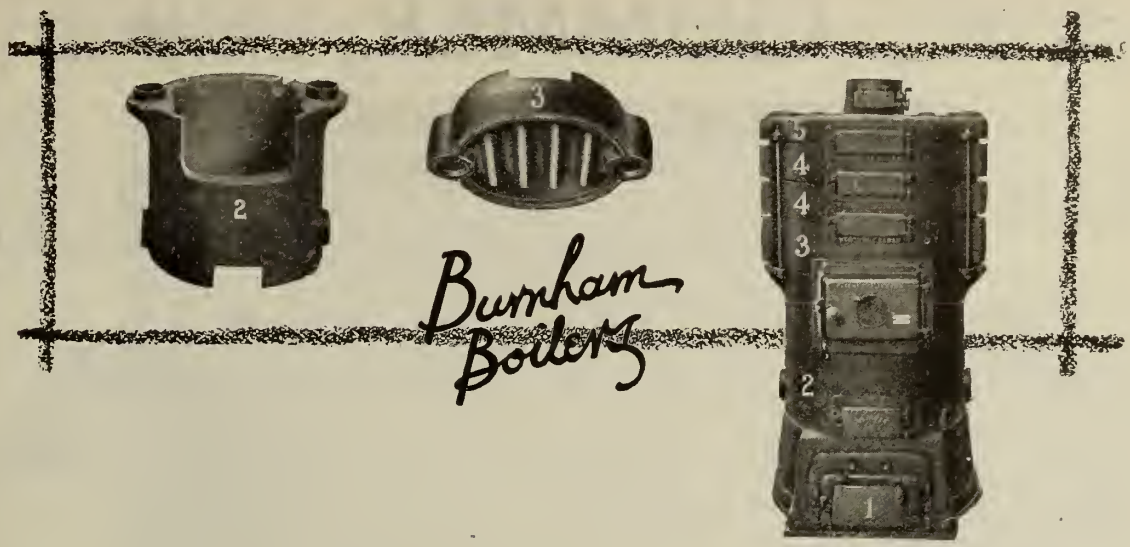
Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

ONTARIO:
Monarch Brass Mfg. Co., 71 Brown St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes, 120 Lombard St., Winnipeg



Why this fire pot is made the way it is made

SUPPOSE every time you had a tire puncture it was necessary to buy a new wheel!

"Prohibitive" you say.

By the same token take a boiler that has the crown sheet and fire pot cast as one.

When by accident or through carelessness of operation they break—that *entire* casting must be replaced.

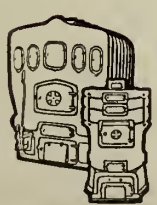
The Burnham is cast separately.

Crown sheet in one section.

Fire pot in another section.

When there is trouble with either one, simply replace the one that's in trouble.

Costs far less. Can be done quicker. Better in every way.



Lord & Burnham Co. Limited of Canada

(Boiler Department)

ROYAL BANK BUILDING, TORONTO

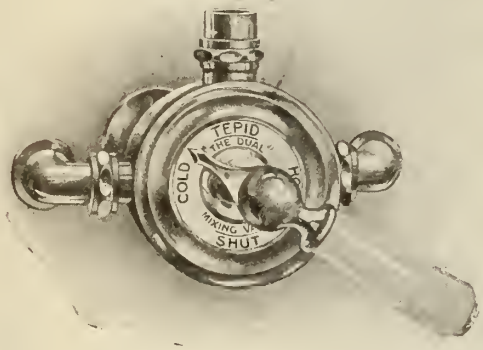
Factory: St. Catharines, Ontario

SANITARY ENGINEER, May 15th, 1919. Published the 1st and 15th of each month at 143-153 University Ave., Toronto, Canada, by the MacLean Publishing Co., Ltd. Vol. XIII., No. 10. Yearly subscription rates: Canada, $1.00; United States, $1.50; Great Britain and the Colonies, 4s. 6d.; elsewhere, $2.00. Entered as second-class matter at the Post Office Department, Ottawa. Entered as second-class matter July 1st, 1912, at the Post Office at Buffalo under the Act of March,, 1897.

G. & W. G. GUMMER, LIMITED

EFFINGHAM BRASS WORKS, ROTHERHAM, ENGLAND

And at
9 Fenchurch St., London



"Dual" Mixer

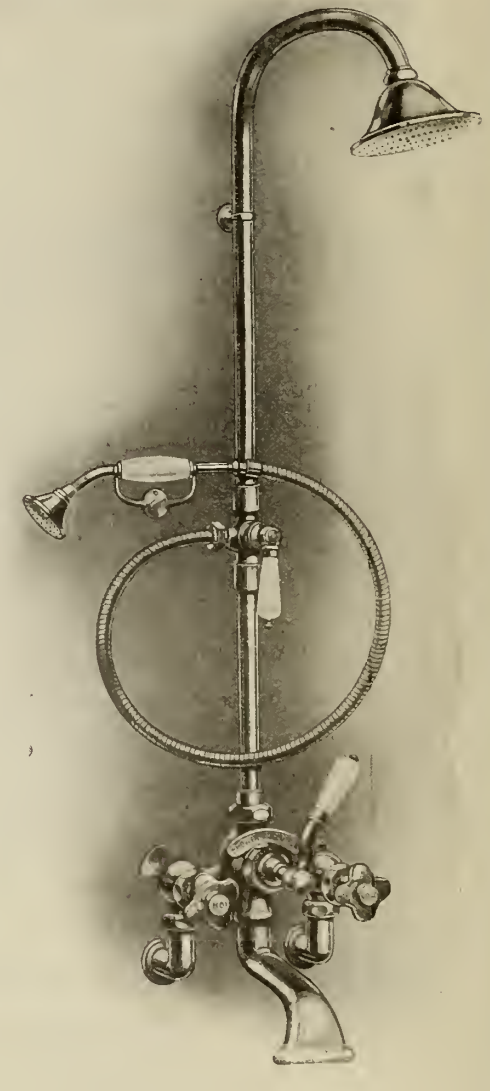
A valve that really mixes Hot and Cold Water, and maintains a uniform mixture.

For ease of operation, simple construction and easy installation, it has set a new standard of efficiency.

Cold Water must be turned on first, no possibility of scalding.

Made in several forms for Showers, Sprays, Operating Rooms, etc.

At the well-known works of Messrs. Brunner, Mond & Co. these valves provide baths for 2,500 employees.



G. & W. G. GUMMER, LIMITED

Manufacturers of every description of

Engineers,' Plumbers' and Sanitary Quality Brassware

Everything For The Plumber

LASTING DEPENDABLE.

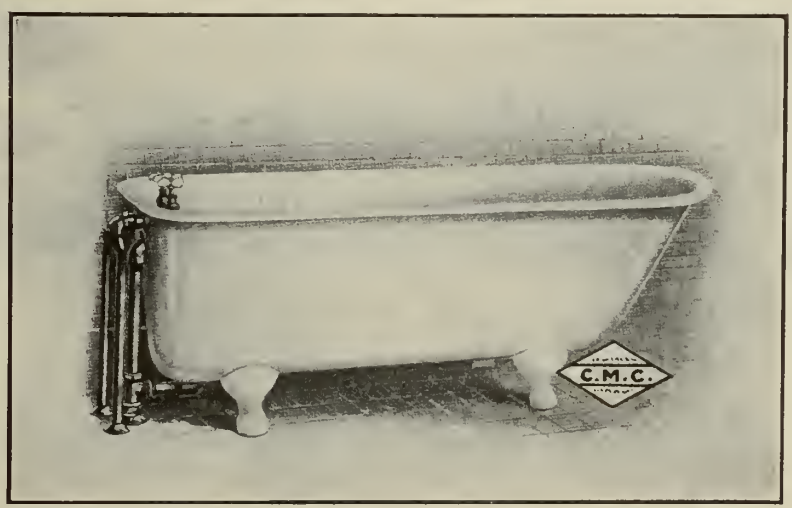
Baths, Lavatories, Sinks, Aristocrat Laundry Tubs, Traps and Bends, Easy Wiping Solder

A Canada Metal Bathroom and Toilet.

SERVICE QUALITY.

Iron Pipe and Fittings, All Brass Goods, Lead Pipe, Sheet Lead, Solder, Block Lead, Etc.

Not only do we manufacture a very complete and varied line of plumbing and metal supplies to meet every need of the trade, but it is our constant endeavor to give the utmost quality and money value in our products.



We have constantly before us the desire to help the dealer in every way possible and to insure him an ample return on any of our products which he carries. Our unusual facilities for prompt shipments are appreciated by all dealers.

THE CANADA METAL COMPANY, LIMITED

TORONTO, CANADA

HAMILTON MONTREAL WINNIPEG VANCOUVER

Quaturn Faucet Features

Being some good information for the Plumber

Closes With Pressure

When the water pressure is fairly heavy the natural tendency of the old-style faucet is to open and leak — with the Quaturn it shuts all the tighter. This is one of the finest features of the Quaturn and will appeal, as it already has, to all users.

Interchangeability

Working parts, such as the sleeve, cap nut, and stem of the Quaturn are standard to all fixtures. You can see the immense advantage of this. You carry only a small stock of repair parts, involving little capital outlay and with them you can repair any Quaturn fixture made. Quick service — small expense large business.

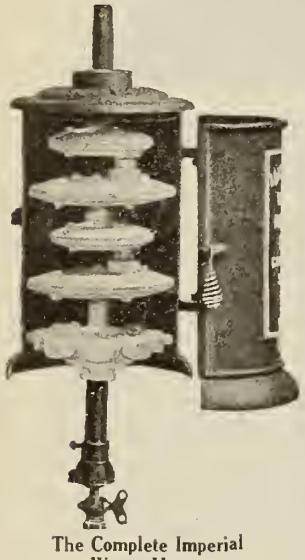
Renewable Parts

The Quaturn body, which is the big factor in cost and installation, lasts as long as the building. The wear comes on the sleeve, which may be replaced at small cost and little work at any time. Your customer will be satisfied and will be your best advertisement.

The WALLACEBURG BRASS & IRON MANUFACTURING COMPANY, Limited

WALLACEBURG, ONT.

Toronto	Winnipeg	Montreal
10 Wellington St. E. Phone: Main 2355	Galt Building Phone: Garry 3389	358 Beaver Hall Sq. Phone: Main 7531
Mr. L. N. Vanstone	Moncrieff & Endress, Ltd.	J. R. Devereux & Co.

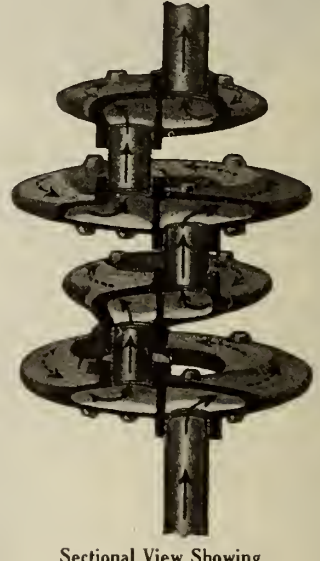


The Complete Imperial Water Heater

BY installing "IMPERIAL" heaters, you serve your customers' interests, as well as your own.

"IMPERIAL" heaters, are made in three sizes, for the ordinary, heavier, or heaviest requirements.

PERFECT HEAT baffling. Absolute water CIRCULATION.



Sectional View Showing Water Flow

POWERFUL. ECONOMICAL.

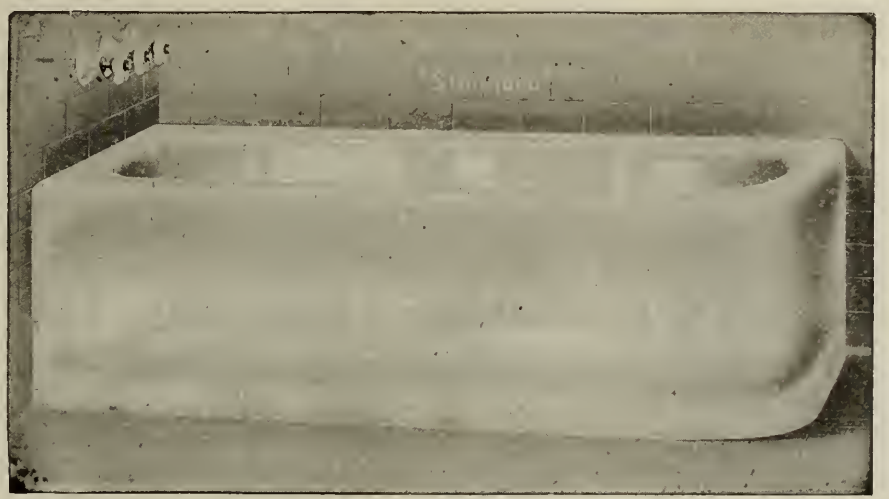
For either ARTIFICIAL or NATURAL Gas.

IMPERIAL CITY HEATERS, LIMITED

SARNIA, CAN.

"Standard"
"Perfection" Built-in Baths

Made in One Piece Enamelled All Over



These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in-Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners meaning bathroom sanitation.

Made in 5 and 5½ foot sizes.

Illustrations on request.

Write the nearest dealer

Standard Sanitary Mfg. Co.
Limited

General Office and Factory: Royce and Lansdowne Aves., Toronto, Ontario

Toronto Store:
55-59 Richmond Street East

Winnipeg Showrooms:
76 Lombard Street

Hamilton Store:
20-28 Jackson Street West

Montreal:
358 Beaver Hall Square

Calgary:
325 Eighth Avenue West

Vancouver:
847 Beatty Street

"MADE IN CANADA"

WILSON FEARED THE BRITISH

THE American President crossed the Atlantic in the first place with the idea in his mind that his ideals would be thoroughly in accord with those of the French statesmen; but he was rather afraid of a conflict with the British delegates. He found in reality that his plan for peace terms was as far removed from the French plan as the two poles. Then he crossed to London and was surprised to find that the ideas of the two Anglo-Saxon powers were identical.

This situation, according to J. W. Dafoe in the May issue of MACLEAN'S MAGAZINE, explains much that has developed at Versailles. Further, it contains the promise of a close *rapprochement* between the two great English-speaking democracies for all time to come.

Mr. Dafoe has contributed a remarkably interesting article to this number of MACLEAN'S, lifting the curtain on many of the puzzling situations that have arisen overseas. As the editor of the Manitoba *Free Press,* he is the dean of Canadian newspapermen; as the representative of the department of Public Information on the Canadian Mission to the Peace Conference, he was in a special position to learn what was transpiring. He tells of the really big part that Canada has played in the Proceedings and points out that Canada's status as a nation was firmly established in the eyes of the world when she was allowed separate representation.

A Dozen Other Features---Nationally Important

This May issue is full of articles of unusual significance for Canadian readers.

"SOLVING THE PROBLEM OF THE ARCTIC"
—By Vilhjalmur Stefansson

The second instalment of his remarkable story of the four years of exploration that he undertook for the Canadian Government in the region of the "Pole of Inaccessibility"—a harder place to reach than the North Pole.

"ORGANIZING FOR PEACE"
—By George Pearson

An article of the Great War Veterans' Association by a well-known author-soldier.

"THE CANADIANS IN SIBERIA"
—By Capt. W. E. Dunham

A graphic story of what our forces did in combatting the Bolsheviki, by an officer who has just returned.

"SAFE IN THE SADDLE"
—By J. K. Munro

A review of affairs at Ottawa in which the opinion is expressed that Union Government for the time being is safely entrenched.

The National Idea

The articles in this issue of MACLEAN'S reflect the national idea—Canada's part in the Peace Conference, the political situation at Ottawa, the exclusive report of Stefansson's national explorations, the national organization of our returned men, the work of our forces in Siberia. The reader of MACLEAN'S gets a broad idea of what Canada as a whole is doing The value of this issue— and of all issues —is very great, therefore, from an educational standpoint.
MACLEAN'S is the one magazine that should be selected for young Canadians to read.

Four capital stories by famous authors—W. A. Fraser, Lloyd Osborne, Frederic S. Isham and C. W. Stephens.

The Review of Reviews

An unusually fine array of articles is given in this department, selected from the best in magazines and periodicals the world over. Some of the titles are:

Planned to Destroy British Fleet.
How Mackensen Was Caught.
Events of War Foretold by Stars.
What is Life Like Beyond the Grave?
A High-born Bolshevik.
The New Life in Dry America.
Germans Were Ready to Capitulate.
Japan's New Foreign Policy.
The Many Kings of Jerusalem.
Is British Foreign Office Against League?
Ambassador Tells Story of Peace Ship.
Hindenburg—After the Armistice.

Over 65,000 Canadian Families Buy

MACLEAN'S

"CANADA'S NATIONAL MAGAZINE"

MAY ISSUE *Now On Sale At All News Dealers*

20c PER COPY. $2.00 PER YEAR

Dealers who have not been handling MACLEAN'S should secure copies at once from their nearest wholesaler.

If there are no newsdealers in your town, or if your newsdealers cannot supply you, send 20 cents for a sample copy or $2.00 for a whole year's subscription to MACLEAN'S MAGAZINE, 143-153 University Avenue, Toronto, Canada.

Mr. "Licensed Plumber"
of TORONTO.

BULLETIN No. 2.

CONSERVATION
Is Still Necessary

"Gas" is the *last word* in fuel conservation—waste is practically eliminated when gas is used.

Your duty is to advise your clients to conserve by using gas wherever possible.

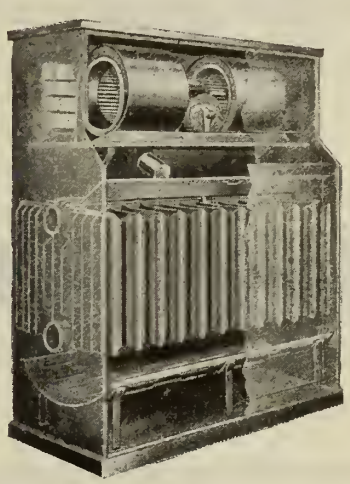
Pipe *all buildings* for *Gas!*

THE
Consumers' Gas Co.
OF TORONTO.

Building Service Bureau - Adel. 2180

The
UNIVENT
"LIVE OUTDOORS-INDOORS"

—A Fine Booster For Your Business—



A light, easy job appeals to most men, especially if the pay is better than ordinary.

In the same sense, a light, easy installation of a Heating and Ventilating System appeals to the heating contractor—especially if there is better profit for him.

The UNIVENT installation can be made with fewer men, in less time, with less actual labor than with any other system—and the ultimate profits are greater—and your client is completely satisfied.

It is good, sound business for you to obtain a good working knowledge of the UNIVENT—the most efficient ventilating system in America to-day.

This system is successfully operating right now in hundreds of buildings of all kinds.

Some valuable territory still open for good sales representatives.

Write for our Engineering Data Book and Catalog in colors. They contain information of value to you. Addreses Dept. G.

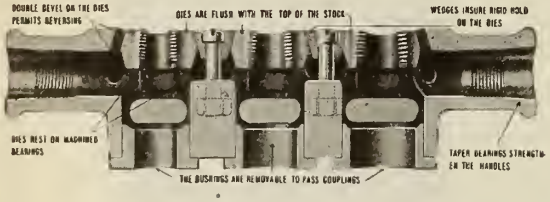
Moline Heat
EVERYWHERE
Moline Illinois

For Easy Pipe Threading
TRY THE TRIO

Simple — Compact — Complete

3 Dies in 1 Stock

The TRIO uses Little Giant Pipe Dies with the patented double bevel which permits reversing---carries the three sizes you use most frequently. TRIO is fully adjustable.


DOUBLE BEVEL ON THE DIES PERMITS REVERSING
DIES ARE FLUSH WITH THE TOP OF THE STOCK
WEDGES INSURE RIGID HOLD ON THE DIES
DIES REST ON MACHINED BEARINGS
TAPER BEARINGS STRENGTHEN TEE HANDLES
THE BUSHINGS ARE REMOVABLE TO PASS COUPLINGS

Always Ready --- Always Right
Ask for Catalogue

Wells Bros. Company
of Canada, Ltd., Galt, Ontario

Canadian factory of the Greenfield Tap and Die Corporation

Pipe Fittings

Made in Canada

M Brand Pipe Fittings, etc., give a service and satisfaction that will invariably get you re-orders and much new business as well.

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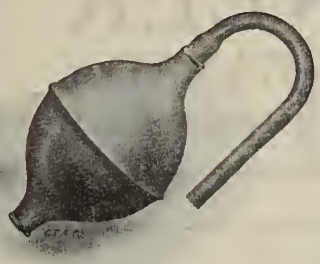

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SANITARY ENGINEER

PLUMBER AND STEAMFITTER OF CANADA

ESTABLISHED 1907 PUBLISHED TWICE MONTHLY

Vol. XIII. MAY 15, 1919 No. 10

CONTENTS

Develop Business Side of Plumbing	13-14
At the Parting of the Ways	15-16
Alberta Plumbers Make Forward Plans	17
Budget, Budget, What's in the Budget?	18-19
Quebec Province Swings Into Line	20
What of Comparative Prices in Advertising	20
What They're Doing in Hamilton	21
Craft in Windsor Organizing	21
Why Hold Back on Building?	22-23
Attend Convention, Urges President	24-25
Message From Saskatchewan President	25
Human Elements in Town Building	26-27
The Importance of the Cash Discount	27
Editorial Comment	28-29
Practical Sheet Metal Work	30
Ventilating the Modern School	31
Heating and Ventilating—The Boiler	32-33
News From Here and There	34-35
Market Conditions and Tendencies	36-38

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"BIGGER AND BETTER BUSINESS." Fine words, easy to say, but they don't mean anything unless there is some force behind them, and yet "BIGGER AND BETTER BUSINESS" means much to every person in the trade.

Bigger business means increased production for the manufacturers, lower prices for the product, more contracts for the contractor and more employment for the workmen. Bigger business will come to us with the revival of building operations, but why wait—now is the time to go after business.

In the last four years, due to scarcity of material and workmen, a great deal of work that should have been done was neglected. Make a survey of your own territory or the neighborhood in which you are doing business, and you will doubtless find that ten, perhaps twenty per cent. of the buildings and homes require new plumbing or replacements of the present sanitary fixtures.

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Be prepared to say what the job, the whole job will cost. It will interest your customers and perhaps surprise you to know that such a bath-room will not cost much more than some of the luxuries upon which people are spending money freely to-day; certainly the money will be better spent, as every dollar spent on the bath-room adds comfort to the home and adds double its cost to the value of the house.

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Established 1907 Circulates Throughout Canada

Sanitary Engineer
Plumber and Steamfitter of Canada

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Develop Business Side of Plumbing

"Only Way to Make Money Out of the Trade," Says New President of the Ontario Association. Tells of Methods by Which He Has Built Up a Steadily Growing Business

Based on an interview by C. E. PARSONS, of SANITARY ENGINEER, with Thos. J. Minnes, Brantford, Ont., President O. S. D. S. & H. E.

"THE plumbers of Canada must forget that they are plumbers, mere fixers of pumps, cleaners of sewers or repairers of ball cocks. They must develop the business side of the trade. They must develop salesmanship. They have got to learn that the public does not appreciate the mere fixer. The trouble has been that we have been educated as plumbers and not as salesmen or business men. We have got to work along new lines and we have have got to learn the value of co-operation."

This is the view of Thomas J. Minnes, of Brantford, Ont., who was recently elected president of the Ontario Society of Domestic Sanitary and Heating Engineers. He is working along these lines, not only in his own store, but in the Brantford branch of the Association, and plans to get the same spirit into the trade throughout the province.

"Handling electrical goods showed me where I was working along the wrong lines," said Mr. Minnes to SANITARY ENGINEER. "I had not been in that end of the business very long before I learned that I had got to be a salesman. We were driven into the electrical business. People who wanted plumbing done frequently asked about this or that electrical work. For instance a man for whom I would be putting in a bath room or making some repairs, would say, "I would like a light here and one there. I guess you can do that just as well as anybody else, and I will not need to get an electrician." There were so many of these calls that we had to get an electrician to do the work. At first we tried it on a ten per cent. gross basis.

Interior view display rooms of T. J. Minnes, Brantford, Ont.

But one of the troubles was to get a good man, and one whose work could be depended on. We finally got our own electrician. It was not long before we discovered that if we were going to be in the electrical business and make money out of it we must not depend upon wiring alone. We just naturally drifted into the business of handing electrical supplies and fixtures. That was three years ago. Now we have three electricians and the business is growing steadily.

Has a Fine Display

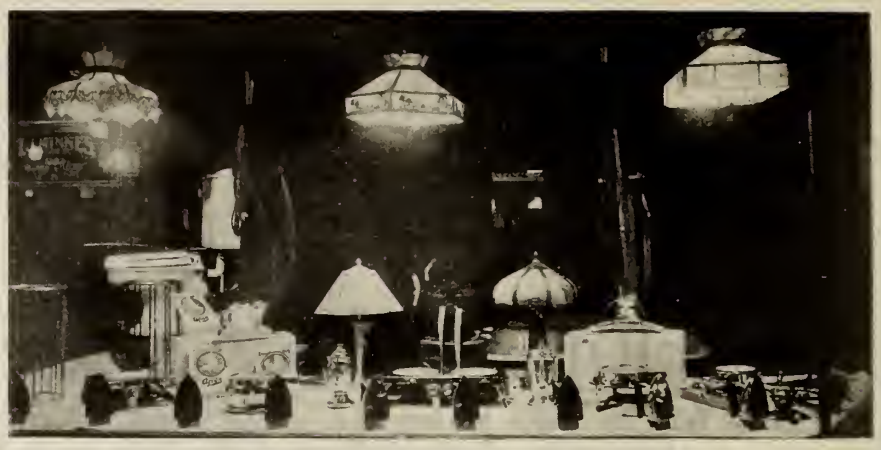
Mr. Minnes soon discovered, he says, that the best way to sell electrical fixtures was to let the people know he had the stock. He arranged an attractive window display. He rearranged his store, and one section of it now contains an attractive showing of lighting fixtures, all connected and arranged so that customers who come down to make a selection can see almost exactly how the fixtures will look when placed in their own homes. Mr. Minnes does not have just one or a half dozen fixtures. He has a wide variety for people to choose from. In other words he carries a stock and this, he says, is one of the foundations of successful selling. People, he says, like to look over a lot of goods and compare one with another. He finds that it pays to carry the stock.

The business has grown steadily, and Mr. Minnes now sells a steadily increasing number of electric washers, vacuum sweepers, electric lamps, electric irons, electric toasters and other lines each season.

Advertising Pays

"It certainly pays to advertise," said Mr. Minnes. "The more complete a stock is the easier it is to sell, always provided you let the people know you have it. The daily press is one of our best means of reaching the people. We use a fair sized space, and we have found by comparing results that it pays to have the ad. inserted in the same place each time. Our location is in the local news section every night. People cannot help seeing it there. We change the copy very frequently, sometimes every day, and always try to have a real newsy advertising message to give the people. We have found that street car advertising produces results also. It reaches a certain section of people. It would not, though, reach, for instance, the man who rides in an auto. It would not reach many others that the daily newspaper reaches. We use the side of our building for advertising purposes, and we use our writing paper and our window. We have adopted a trade mark that we want to become known everywhere in our territory. It is "The men who know." We use this at the bottom of our ads., in our window, on our letter heads and on our stickers. On every parcel we send out a sticker is attached, bearing the firm name. All these things help to impress our store and our service in the minds of our customers."

Mr. Minnes declared that his experience is that theatre programs are of little use for advertising the lines he carries. This class of ad. catches people at the wrong time, when their minds are busy with something else, and they are not thinking of buying, he says.



Window Display Electric Fixtures Made By Thomas J. Minnes, Brantford, Ont.

"In all our advertising," he stated, "we try to say what we have to say as simply and in the fewest words possible. We always try to give whatever details we think the people would ask if they were in the store talking to us, that is the essentials. There are a few things that everyone wants to know. The price, what a thing will do and what it looks like. We usually use illustrations, and nearly always give the price. All sales talk is reserved until the people come to our store. Then we go after them and explain fully all the points of superiority in whatever line we are showing. I would say that it certainly pays to handle advertised goods.

Tell One Another

"Satisfied customers, especially women, are one of the best selling forces we have. Take electric washers for instance. A woman gets one and is satisfied with the work it does. She tells every one of her friends, and more than that, very often shows them how it works and how it saves time. We can get no better ad than that, and we have sold a number of machines simply because our friends practically made the sales for us.

Mr. Minnes here reverted to advertising to recall an experience he had. He stated that the firm had been handing a line of high priced gas ranges prior to the war. Not long after the war started prices got so high that he decided to quit handling them.

"I got cold feet," he said. "We had been advertising the stoves and selling them, but when the prices reached the point they did I said there was no use trying to sell any more, and we quit advertising them and stocking them. For months after people kept coming into our store and asking about these stoves, saying they had seen our ads and knew we handled them. I learned right there the effects of advertising. You must not expect results too soon for one thing. This year's advertising will help your next year's business. Sometimes it takes quite a while to get the best results from advertising a line, but if you keep at it you will get them."

Mr. Minnes is a former president of the Brantford branch of the Ontario Society of Domestic Sanitary and Heating Engineers. He is one of its best workers and one of the most thorough boosters for organization and co-operation.

"It has produced results," he said. "Nothing that I know of could have accomplished the results among our boys in Brantford that we have obtained through our club. The trouble that is one of the worst troubles in the trade in many places was right here in Brantford, that is, price cutting. The boys were suspicious of one another and there was no organization. We got together and we have been working along definite lines, and we are getting results. We have talks on salesmanship and trade problems and we pull together now. We understand the other fellow's viewpoint and we have learned that he is not such a bad chap after all, and that very often unless we really knew the circumstances we were misjudging one another. One of our latest plans is to try the 'open price' system. We will see how it works, and I am satisfied personally that it will work and that it is the right method to work along."

Making Salesman

"We are making our salesmen and the results are surprising. It is far better in a great many cases where we are called to make repairs to put in a new part. If this is done the customer starts again with something that should give service. If repairs are made it is usually only a question of a short time before the thing needs repairing again. All our men are now instructed to sell new parts or new goods wherever possible. This plan makes for better satisfied customers, and it is better for us. There is any amount of new business that can be created by suggestion and we are working now to get all of it we can. I know conditions in Ontario fairly well, and I think I am safe in saying that Brantford plumbers are second to none as salesmen in the whole province. Here is one example of what can be done. One of our men went to an institution after being called to make a minor repair. He found that not enough hot water was being supplied to get the proper results from an electric washer that had been installed. He made cer-

tain suggestions and showed those in charge where time and money could be saved by making certain installations, and by adding certain wiring. As a result we got $854 worth of work from what at the start was only a job of a couple of dollars. The people were tickled to death too, after the work was finished, because everything worked so much better. There is a big field for every plumber along this line. I am satisfied that salesmanship should be practised by each man, and that in the great majority of cases it is bad business to make repairs.

Don't be a Knocker

"In selling either in the store or out on the job," says Mr. Minnes, "never be a knocker. Don't belittle the other fellow or any other line of goods that you are not handling. If you can't say anything good about them don't say anything and you will be better off in the end. We always try when selling to urge people to take the best quality of goods, and we find that it pays. People appreciate service, not only in the store, but in what they buy. Many people depend to a large extent upon the recommendations made by the men in the trade in buying, and it is easy to sell them a really good article and get more for it and more profit than some cheaper line that will not give them the results they want. In selling electric washers we keep track of every one that goes out of the store, and if we are in the vicinity of the house drop in and ask to see it. We frequently find that it needs oiling or adjusting although the owner will declare there is nothing wrong, and that it is running beautifully. Our customers thoroughly appreciate this sort of service, and, as I said before, they boost sales for us. When people come in to buy a washer we never try to sell them right there and then. We refer them to Mrs. So-and-so or Mrs. So-and-so, whom we know that they know. We ask them to go to the house and see the machine work and hear what the woman says about it. When they come back the sale is easily made, and they, in turn, become boosters for us.

Means Big Loss

Speaking of the results that have followed the formation of an association in Brantford, Mr. Minnes referred to a manufacturer from out of town, who did not deal fairly with the plumbers, in that he sold directly to a certain firm a fairly large order of goods required for some work the firm had in hand. The plumbers found out about it, and the members of the association have not handled a dollar's worth of the firm's goods since.

"They may have made a few dollars on the sale," said Mr. Minnes, "but they have lost a good many thousands in not having their goods handled through the nine members of our association. By standing together and working together in this way we can get results where no individual could do anything."

At the Parting of the Ways

Ontario Secretary Gives His Views—Chance Now to Get Together—Need of Federal Plumbing Code—Apprenticeship Question a Live One at Present—Views of Members

Written for SANITARY ENGINEER by C. E. PARSONS.

THE plumbing and heating business in Canada is at the parting of the ways. In the opinion of Secretary Garrett Frankland, of the Ontario Society of Domestic Sanitary and Heating Engineers, 1919 will be a fateful year for all those in the trade.

"We have the chance now to get together and do something," he said to SANITARY ENGINEER. "There is only one way to get results and that is through co-operation. Perhaps no business in the Dominion has more problems to solve than the plumbing and heating business. No one man in the trade can solve these, but if every man from coast to coast will do his share we can win out and put the whole trade on the plane it should be on.

Go to the Meeting

Every man should make it a point to go to the meeting of the Dominion Society in Montreal on June 3 and 4. There will be a lot of matters of vital importance to the trade to be discussed. If there is a good turn-out of members and the interest taken in matters that should be taken, we are going to be a big factor in the affairs of the Dominion. One of the troubles in the past has been that the plumbers have been an easy-going lot of chaps, not alive to their own interests or the interests of the trade. The time has come when if they get together and work together we can accomplish results worth while. This is the first Dominion annual meeting since 1916, and it should be a record-breaker. I am satisfied that Toronto is going to send at least fifty delegates, and there will be delegates from Brantford, Guelph, London, Windsor, Hamilton and other parts of Ontario."

Two-day Session

The sessions will be held in the Caledonian Club Rooms at 101 Burnside Place, Montreal. The executive meeting will commence at nine o'clock on the morning of June 3, and the general meeting opens at two o'clock on the same afternoon. Sessions will be held the rest of the day and all day on June 4.

"The spirit of to-day is organization and co-operation," said Secretary Frankland. "We learned from the war that that is the only way to win. It is gratifying to see the way in which many members of the plumbing trade are coming out of their shell, getting together and working for to make things better. That is the only way to work."

In the opinion of Mr. Frankland one of the most important things that should be brought up at the Montreal meeting is the formulation of a Federal plumbing code.

"This matter should be urged upon the Dominion Government in the interests of the national health," he said. "The Government at Ottawa should take the lead in this work and set the example for the rest of the provinces to follow. There is nothing of more importance in the development of a nation than the health of the individual people. As far as the Government is concerned, this matter has, to a large extent, been neglected, especially from a plumbing and sanitation standpoint. There is a great amount of research work to be done and the sooner it is started the sooner results will be accomplished. The Federal authorities should take the lead in framing a code that will serve as a standard for the provinces."

Some Other Views

President Thomas J. Minnes, of Brantford, Ont., who was recently elected as head of the Ontario society, is busy arranging matters he plans to bring up for consideration. He is getting in touch with a number of members in various parts of the province and finding out from them what they think should be taken up.

"One of the most important things we can do," he stated to SANITARY ENGINEER, "is to show members all over the country that they must be business men.

Every man in the trade will benefit as soon as the plumbers of Canada realize and practise this. Perhaps no members of the trade in Canada have more thoroughly learned the importance of organization and co-operation than the plumbers of Brantford. They have gained the confidence of one another. They are prepared to help one another. I am safe in saying that there is no man in our organization who has not learned many things of value since we got together. The same thing applies all over the country.

Apprenticeship Question

The apprenticeship problem is one which has been causing a lot of trouble in many parts of the country, and Mr. Minnes plans to bring the matter up and endeavor to arrive at a solution. Education along technical lines, he believes, is one of the essentials to be considered in connection with whatever course is adopted.

Something should be done, he believes, to bring plumbing inspectors all over the country under the direction of the Boards of Health.

"As it is now," he said, "many of the inspectors work under the city engineer, the building inspector or perhaps no one in particular. Public health is too important a matter to take any chances with, and the man who should know more about public health than anyone else is the Medical Officer of Health. He is usually one of the most important members of the Board of Health. Plumbing and sanitation and health are more closely related than any other civic matters, and there are none that need more careful consideration. By working together the Medical Officer of Health, the Board of Health and the Plumbing Inspector can, I believe, accomplish maximum results. Under the plan followed at present in many places plumbing matters are really a detriment to health. In my opinion the city engineer is not the man who is most competent to judge about health matters. That should be the job of the M.O.H.

Too Much Neglected

Not enough attention is being given to this matter in general. What interests public health is public business and should be given the most careful consideration. I think there is no question of doubt that if many houses the country over were given the inspection they should be given they would be condemned. This would result in a lot of work being done that would improve conditions and the health of the people as a whole.

Mr. Minnes believes, also, that something should be done to direct the attention of the Government to the standardization of the plumbing by-laws. This is one of the matters he believes the newly-organized Federal Health Department might look into with good results to the public at large. There is a big field for operations in this work all over the country, he says.

Wants Resale Price

John Cunningham, of Cunningham & Co., Paris, Ont., thinks that one of the most important matters to be taken up at Montreal should be getting the wholesalers to adopt a system to keep prices the same. He instanced specially the case of pipe, stating that many firms, not plumbers, can go and buy pipe just as cheaply as the plumber can. Not only pipe, he says, is sold this way, but other goods.

"They should keep prices the same," he said. "It makes a fool out of the plumber when he quotes a price after being asked and is told that the party wanting pipe or some other goods can buy it for so much. It is not fair to the plumber and the wholesaler should protect the trade. This sort of thing puts you in bad with customers, especially if you have done any work for them before. They get the idea you have been robbing them. As far as the wholesaler is concerned he takes no chance when it comes to collection. He gets his money from the plumber. But the plumber has to take a good many chances when he sells to the public.

Might Use Movies

Mr. Cunningham says something has to be done about the apprenticeship question and done soon unless the trade is to suffer.

"Some action must be taken to stimulate interest in the plumbing trade," he said. "Perhaps if movies were used to present to the young men and boys who are growing up some of the technical feats in the work it might help. Boys and young men are very often influenced by seeing workmen performing interesting or difficult operations and want to learn how to do it. An important matter in connection with apprentices is that of technical education also. It seems to me good results might follow if a provincial instructor of apprentices was appointed by the Government to visit each city or town regularly and instruct the boys. Lack of apprentices and proper training will certainly have the effect of lowering the standards of the trade unless it is checked."

Would Have a Chance

John Eggett, of Eggett & Co., London, Ont., said that he would like to see something done in connection with the present method of awarding Government contracts. He is opposed to the plan by which bulk tenders are awarded to one man, who sublets the plumbing, heating and other contracts.

"Each trade should be given a chance to figure on its own work," he said. "Many of the larger jobs are too big for a plumber to put up the necessary deposit for a bulk contract. Many firms, however, could do this on the plumbing and heating work. I think it would work out better for everybody. As matters stand now the general contractor gets a profit out of the work. If each man were given a chance to tender on the work he would be assured of getting the business if his figures were the best, and the Government would be able to get better figures."

Secretary E. H. Russell, of the Master Plumbers' Association, of London, expects to attend the Montreal convention and stated to SANITARY ENGINEER that if he does he will endeavor to have the plumbers, the manufacturers and the insurance companies combine their forces and work together in solving matters that are of mutual interest to all.

"There are many questions," he said, "in which the plumbers, the manufacturers and the insurance men are interested. There is no quicker way of getting results than by co-operation and with three forces centred upon solving any problems that come up I believe we could get excellent results."

Secretary Russell also spoke about the need of a change in the method of awarding Government contracts and favored giving every firm a fair chance to tender. "I think," he said, "it is in the interests of the people at large that each trade should be given a chance to tender on its own work instead of it being farmed out through the general contractor. It is too serious a thing to tinker with. By giving each firm a chance to figure, better results would be obtained and it would make for efficiency all round. As it is now many plumbers have to waste a lot of time and energy for nothing as the general contractor goes around and gets all the figures he can and often takes the lowest."

He thought, also, that something should be done to speed up the signing of the new Ontario Act. "It ought to either be accepted or rejected," he said. "All it needs is the signature of the Lieutenant-Governor. If it is put through this act might serve as a model for the other provinces."

Alberta Plumbers Make Forward Plans

Good Outlook Expressed by Provincial Vice-President Marr—Provincial Health Law to be Revised—Profits are Discussed—Interest is Wide—Interested in the East

Written for SANITARY ENGINEER by A. H. ILLSEY.

THERE is an evident interest in the sunny province of Alberta in matters that affect the plumbing trade. SANITARY ENGINEER is in receipt of a letter from provincial vice-president James Marr, in which he echoes the splendid spirit of members of the craft, and which clearly denotes the forward look that is held there by himself and his brother plumbers. This is the spirit that begets progress, and excerpts from the fine letter of Mr. Marr will indicate that there is no sleeping in Alberta, and that a better day is dawning for the trade generally.

Held Early Meeting

Calgary's Horse Show Week in March, was the time chosen for holding the Alberta provincial convention this year. In response to the call sent out, a large number gathered from north and south, east and west, enabling the officers to feel that their efforts to get the boys together was not in vain. "A goodly response," writes Mr. Marr, "was made to the call, from all parts, and you can see by the picture which accompanies this letter that a good and healthy bunch got together on some of the most vital questions pertaining to the trade. Organization was taken up, and well sustained. It was quite evident, by the interest that the men took in discussing the question, that they were all alive to the great subject that is agitating the minds of the people at this time, namely, the getting settled of our boys, as they return from the war, to good business."

How to Make Money

"A campaign of education," continues Mr. Marr, "on how to do business at a profit, that goodwill and prosperity may attend the efforts of all those who would do justly by his neighbor, was discussed."

Surely the convention struck a most important note here. The plumber, as the Dominion president of the Canadian Society told the writer a few days ago, is one of the best tradesmen in Canada. He must be alive to his opportunity. If he will interest himself in the problems that must receive attention, he will greatly profit. And he cannot do better, surely, than to follow good common sense by studying his costs, and making quotations on his work that are in keeping with these costs, allowing himself a sane, living margin of profit. All power to a movement that has this as its ultimate goal. No tradesman can progress on an uncertain basis, and SANITARY ENGINEER wishes this part of the Alberta boys' program the greatest success.

One of the biggest questions receiving attention at this convention was that of a revision of the provincial health by-laws. Mr. Marr states: "The provincial health laws, as applied to plumbing, was the next question taken up. This also came in for a good, healthy discussion; a committee was appointed to go over the laws, and make such additions and amendments as they thought desirable, and bring in a report. Later this report was submitted to the whole convention, and, with minor alterations, approved. A deputation was appointed to wait on the Minister of Health at Edmonton. I may say that this deputation was well received by the Hon. Mr. McKay, who listened to the various members attentively, and who took a lively interest in their remarks. Another meeting will be held later, when a fuller discussion of the various changes in the health laws, as they pertain to the plumbing trade, throughout the province, will take place. The Provincial Board of Health will then meet the deputation."

Sends Good Wishes

Mr. Marr leaves no doubt as to the attitude of the Western plumbers. He indicates clearly that they are alive to the advantages ahead, and that they mean to place the plumbing fraternity upon a high plane.

"It is a long way to Montreal from Alberta," he continues, "and you will have

Continued on page 35

Budget—Budget—What's in the Budget?

Speculation Rife as to What Finance Minister Will Set Forth—Opposition Leader's Views Cause a Sensation—Low Tariff Element Seems to Have Subsided

OTTAWA, May 15.—Sir Thomas White recently announced that the budget would be brought down in the near future, and speculation as to what it will contain naturally grows keener; but expectations, as far as the low tariff wing in Ottawa is concerned, are not great. In fact, some of the most radical of the Western low tariff men are understood to be becoming reconciled to the fact that they will have very little to take back to their constituents in response to those telegrams which, during the session, have poured in on them thick as the leaves on Vallombrosa. Even Mr. Maharg who, during the early part of the session, in an interview with a MacLean representative declared that the War Tax of 7½ per cent. had to come off first shot out of the box, before attacking the main tariff, has now come around to the view that a reduction of the War Tax on necessaries will be about right; and he, like many other Western tariff reformers, will accept a considerable reduction from his early "ultimatum."

The Opposition Leader Speaks

When the Leader of the Opposition announced in the most casual way in the House on Friday, that he was a protectionist, he further added to the extraordinary mix-up which Parliament presents this session. Mr. McKenzie's exact utterance, which promises to become more or less historic in the annals of the Liberal party, was as follows: "While I am not a very high protectionist, I am not in favor of the tremendous wall which my friend from Peterboro (Mr. Burnham) would like to build; but I cannot help knowing that protection of certain industries has done much for this country. I cannot help knowing that in connection with this very plate industry we are talking about and the institution of the steel works at Sydney, those steel works have furnished a market for our Nova Scotia coal and employment for thousands of colliers who to-day would not be employed were it not for the assistance which the Government in the early stages gave to the development of our steel and iron industry."

Caused a Sensation

It is not too much to say that this utterance caused a sensation. It was a formal announcement of the well recognized fact that, so far as the tariff goes, there is little or no difference between the two parties. The only free traders now in captivity are the few doctrinaires who air themselves once a year at the Grain Growers' convention, where even their leaders no longer agree with them.. Mr. McKenzie's own following is divided, however, and apparently had no idea that he was about to make the pronouncement he did. One of them afterwards expressed the view that he thought his leader had temporarily lost his head; and that he certainly did not represent his—the speaker's—views. Officially, the Liberal party is still anti-protectionist, and old Liberals have to talk like this; but, actually, there is not much doubt that the two parties are to-day not very far apart on the tariff. Strong evidence of this is found in the fact that a paper like the Halifax *Morning Chronicle*, which has been known as the Liberal Bible in Nova Scotia, is now openly in favor of a reasonable protective tariff. The action of the Leader of the Opposition was, no doubt, considerably influenced by the fact that his constituency is located in the centre of the steel industry in Nova Scotia; but his personal hold on the constituency is so strong that he does not require to sacrifice his ideals, and he was no doubt speaking from considered convictions. It may indicate the line which the majority of Liberals will take at the convention called for next August; but, if so, there is likely to be a lively convention.

Poor Political Tactics

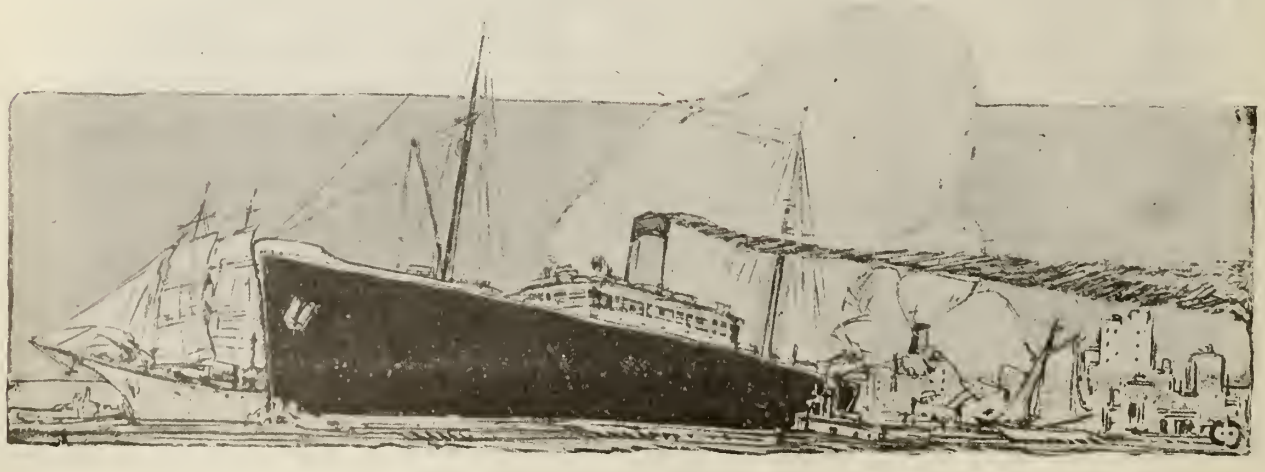
But, however it is looked at, it was a very poor exhibition of political tactics. It made the amendment proposed by Mr. McMaster some time ago look more foolish than ever, and it was considered foolish enough when proposed. It materially strengthened the tactical position of the Government, which has been considerably embarrassed by the attacks of the Western members. It placed those members themselves, and also the member for Red Deer, Michael Clark, definitely in the class of political orphans. Dr. Clark has already moved away from the Government side, and over to the cross-benches; and it would not be surprising to see members like Mr. Maharg, of Moose Jaw, Mr. Read of Yorkton and Mr. Andrew Knox of Prince Albert soon follow him.

Low Tariff Men in Difficult Position

The position of the Western low tariff men like those mentioned has become very difficult. They seem to feel that their case for tariff reduction is practically lost, so far as the present session is concerned. They expect very little consideration from the Government, and have now little reason to cast in their strength with the Opposition.

What of the West?

From the experiences of the Western low tariff men in this Parliament, it would not be surprising if the future should bring about new political alignments in the West. The Western members are having the conviction forced on



them that the low tariff sentiment is considerably less powerful in Canada than it seems at an enthusiastic convention of the Grain Growers in Saskatchewan. Apart from that Province itself, there is no part of Canada where protection is really in bad odor. Eastern people are sometimes inclined to think that the West as a whole is low tariff, but this is far from being the case. In British Columbia, sentiment is in favor of a protective tariff, with the lumbermen and the fruit-growers both favoring it. Alberta and Manitoba are far from being solidly anti-protection. Saskatchewan alone can be called a stronghold of the low tariff party. The Western members who were so vociferous in the early part of the session are beginning to realize that the East is a pretty big factor, and that there is mighty little purely free trade sentiment left in it.

In Alberta, I notice that the Grain Growers and Nonpartisan League is having a sort of rapprochement. Sometime ago the possibility of a union of forces on the part of certain Western electoral powers, such as the labor and agrarian parties, was suggested. If the West is to effect much in Parliament, some such union of forces will probably be necessary.

The time seems rather a crucial one for the West, nevertheless. There has been so much protest and threatening from that quarter all this session, that the House is rather interested to see just how much bluff there was in it. The high tariff men, who have been urging the Government to stand pat, have always minimized the sincerity and the seriousness of this Western agitation, claiming that it was largely froth, and would not be crystallized into action. If no substantial reductions are now made in the tariff and th West stands for it patiently, it is certain that the high tariff sentiment, both in the country and in the Government, will be greatly strengthened and heartened.

The Western men are, therefore, between the devil and the deep sea. The Opposition (which is nothing if not independent, so far as attempting to attack supporters is concerned) does not appear to care whether it adds to its members in the House or not. About the only thing the Western low tariff men can do to express their disapproval is to form a wing of their own in the House; and there is not a sufficient number of them to make much of a hit.

The longer this question is before the House, the fewer become the out-and-out low tariff men, even from the West. Mixing daily with members in the House who are either moderate or high protectionists, their attitude inevitably becomes affected to a certain extent by the company they keep. They feel somewhat like the obdurate juror, who holds out against the other eleven. Few men have the courage to maintain an extreme position to its extreme limit among men with whom they mix intimately every day for months.

Hence we see Mr. Maharg, the protagonist of low tariff, much more vociferous when in the West than he now is in Parliament. Perhaps this is due to some extent to the fact that while here he is not immediately under the eye of Mr. Musselman, secretary and moving spirit of the Saskatchewan Grain Growers, who has always influenced his opinions a good deal. Mr. Maharg is said to be a Tory at heart, and has a stout Tory brother at Brandon. At all events, if he does not receive more comfort from the budget than is now anticipated, and takes it without some emphatic action, the protectionists of the East will take fresh courage and the Grain Growers of the West are likely to get a new leader.—T.M.F.

THE SOLICITATION OF BUSINESS

A storekeeper is a man who keeps a store; while a merchant is a man who sells goods. A storekeeper waits for customers to come to him; a merchant takes his wares to prospective buyers, and by the arts of salesmanship induces them to purchase what he offers. The solicitation of prospective buyers may or may not appear to be hard work—it depends on the man. Some men are born salesmen; they delight to sell, to have a prospect in front of them whose mind and will must be brought into accord with the mind and will of the salesman. But one can acquire the ability to sell, just as one can learn anything—how to jump, or use a typewriter, or play golf, or fly an aeroplane, or control his temper. For a plumbing dealer to say, "I cannot bring myself to solicit business," is to tell a lie. What he means, if and when he says such a thing, is that he finds it distasteful or troublesome to solicit business. If we let our feelings guide us and regulate our practices, many of us would change our wives, would kill our enemies, would win the war and quit working.

If it be granted that a plumbing storekeeper should change into a plumbing merchant—that is, should become a solicitor of business—then one form of commendable solicitation is newspaper advertising.

Current Events in Photograph

MAY BE FIRST TO FLY ATLANTIC

Harry Hawker and Commander Grieve, after numerous tests, declare themselves perfe c t l y satisfied with the behaviour of this machine. In it they hope to be the first to cross the Atlantic and win the prize of $50,000 offered by the London Daily Mail. The machine has exceptionally powerful engines.

Quebec Province Swings Into Line

Will be Represented at Montreal Convention Next Month—Better Days Ahead for Plumbing and Heating Trade in This Province—Here is Real Encouragement

THERE is little doubt but that the Master Plumbers of Canada are alive to the good things that are coming. They realize that these cannot be got without going after them, and this will mean bigger and better organization throughout the country.

Quebec Province is already in line, and there is a great deal of interest in Quebec City at the present time. There, the latest effort has been directed toward interesting the members of the craft in the plumbers' section of the Builders' Exchange, and real progress is being made. The following form a committee of ten, and the names are those of some of the leading master plumbers of the rock city: C. Huot, of A. Huot, Reg'd; L. Letarte, of P. P. Giguere & Co.; E. Matte, of Vaudry & Matte; M. Gaudry, of O. Picard & Sons; F. Gingras, H. Jobin, E. G. Brousseau, of Brousseau & Frere; John Walker, P. Noel, P. Paradis. With a personnel such as this there should be real action from the pumbers' section, and progress will doubtless be very decided during the present season.

Mr. J. Clifford Huot was elected president of the plumbers' section, and is already planning aggressive work, it is understood, for his committee. With cooperation from them there ought to be great things ahead.

In a letter received from Mr. E. G. Brousseau, president of the Quebec Builders' Exchange, SANITARY ENGINEER is informed that full organization of the plumbers has been effected. This was done on April 15, and with the above result. Mr. Brousseau says, in part:

"The master plumbers of this city are as well organized, if not better, than any city in the Dominion. I was elected president of the Quebec Builders' Exchange on January 17 last, and at that time only six master plumbers were members of the association, and the plumbers were the only trade that had no committee to report to the association.

"During the month of April, in provision of difficulties with the journeymen, and which may happen here as well as in other cities, I took advantage of this and called a special meeting of the Builders' Exchange, and we succeeded in forming a committee of a few master plumbers."

A meeting was subsequently called of all the plumbers of the city, and they were urged to come, in their own interest, and to their own advantage.

"There were seventeen at this meeting," continues Mr. Brousseau, "outside of our membership, and twelve of them immediately signed their application and paid. I called a second meeting a week after, and had the same success, twelve more joining. We have now thirty master plumbers in our association out of thirty-six or thirty-seven in the city of Quebec ——."

E. G. BROUSSEAU
Master plumber, Quebec, President Quebec Builders' Exchange.

"Our committee met yesterday, and a nice programme was studied, the principal articles being by-laws, improvements in our general relation to contractors and architects, particularly as regards balance left in guarantee on contract, which we find too high when it is remembered that, besides a check of 15 per cent. of the whole amount of contract, they retain 15 per cent. more on each of our estimates."

Other important items were considered such as the terms and treatment that should be expected from the supply houses. It was endeavored to take steps that would prevent the necessity of the plumbers fighting one another after general contracts are awarded.

Mr. Brousseau is making plans to attend the June convention, and it is to be hoped that the Sister City will send a very large representation. All will be welcomed by their English and French brothers in the trade, and it is not necessary to be appointed a delegate to entitle one to attend. All plumbers are eligible and will be warmly welcomed.

ONE LEADER'S VIEWS WERE SUMMED UP BRIEFLY

"A receptive attitude toward such ideas and suggestions, I find, keeps me alert and sensitive to ever-changing conditions, and minimizes the danger of getting into a rut and fossilizing.

"There is such danger, and we as dealers are wise if we avoid it by every means at our disposal."

What of Comparative Prices in Retail Advertising?

Has the use of "comparative prices" in retail advertising been abused to such a degree that an advertisement is weakened when the claim is made that the article is worth so-and-so, but is being sold for so-and-so (a low price)?

Some of the leading retail stores have concluded that such statements have so often been untrue that they are losing their power to produce trade because of this feeling and the knowledge that the "comparative price" is a constant temptation to department managers and others to exaggerate, they have eliminated such statements entirely.

They believe—and their sales records bear out the assertion, says a bulletin from the Associated Advertising Clubs —that a well-written description of the goods, followed by the announcement that prices are uncommonly attractive, is a stronger appeal than the other style of store advertising. Prices are, of course, usually stated, though not on all occasions.

The Associated Advertising Clubs are seeking further information on the subject, and to this end, William P. Green, organization secretary of the National Vigilance Committee of the Advertising Clubs, recently issued a letter to a number of representative stores in many of the more important communities of the country, which reads in part as follows:

"We are interested in having your viewpoint on such questions as use of the term "value," the conditions, if any, under which goods in lots may be advertised "values up to," and such other phrases as your experience has shown you to enter into a determination of right policies.

"We would like to have you tell us whether some stores, by reason of size, class of goods handled, or business conditions, are justified in using comparative prices, and if so, to what extent.

"Also please let us have your reaction on this—if a store announces that it does not use comparative prices in its advertising, but subsequently advertises goods "one half off," without stating either the original or sale price, is this, in your opinion, really comparative price advertising? Kindly explain your answer."

What They're Doing in Hamilton

Getting Away From Price-Cutting Evil—Blackboard Talks at Association Meetings—Social Side of Co-operation Encouraged

PRICE cutting has been and is one of the curses of the plumbing trade all over Canada to-day. Perhaps one of the worst places of all was at Hamilton, Ont. Note the WAS, because in the past few months Hamilton firms have been getting together and discussing the situation and finding out that if they want to make any money they have got to eliminate price-cutting. They have been getting together because they have an association, and the association has grown steadily because the sessions are made of real practical value to the members. A year ago the association had six members, to-day it has twenty-five, and one by one the firms not represented are coming into the fold.

Lots of Work

It has meant work, lots of work to put the Hamilton Association in the position in which it stands to-day, but the president, James H. Cunningham, likes the work and determined to see it through.

"One of the hardest things in connection with the association work," he stated to SANITARY ENGINEER, "has been to get the boys to realize that they have a common interest. They did not see the value of co-operation. They did not understand that in order to get results they had to work together. They were frequently openly suspicious of one another, and when a man is in that frame of mind toward another it is hard work to get him to see the good that is in a movement such as our Hamilton Association. However, by getting together and finding out that what was one man's problem was usually that of another man, they have learned and are still learning the value of pulling together."

Meet Regularly

Meetings of the Hamilton Association are held every week. Three weeks in every month the sessions are at night and on the fourth they are held in the afternoon. The afternoon meeting is generally one of the best attended of all.

The members realized early the value of impressing upon all the plumbers the value and necessity of doing business in a business-like way. With this end in view, blackboard talks have been given in which actual business problems are figured out. The members are shown the best ways of figuring and of conducting business in general. They have seen the value of working along these lines and of cutting out ruinous price-cutting, and as a result of what they have learned there is perhaps fifty per cent. less price-cutting in Hamilton now than there was a few months ago.

Ban It Altogether

President Cunningham is working with the aim in view of having price-cutting reduced to an absolute minimum before long.

"We cannot get rid of this evil too soon," he said to SANITARY ENGINEER. "It has been responsible for a good many local men losing money that they should have made. We are working towards the 'open price' plan which has been adopted by the electrical men and I think it would be a splendid thing for all of us."

The Hamilton Association has under consideration some of the big problems not only of the trade but affecting public health. It keeps a very close line on conditions in Hamilton, and is in close touch with the plumbing inspector and the Board of Health.

Apprentice Problem

The problem of apprenticeship is not nearly as acute in Hamilton as it is in many other parts of the country.

"We can get any number of boys to go into the business," said president Cunningham. "We are working to give them the best of training through the technical school, and in this work we are securing the co-operation of the members. This is an important matter for the future of the trade, and we are working with an eye to the future and turning out of all around workmen. Very often we find men in the trade who have picked up the business and can only do one or two things reasonably well. If you put them at a new line of work they are lost. The training that the apprentices in Hamilton will get through the schools will end this and make for the production of better workmen.

Will Get Together

One of the things the Hamilton Association encourages in every way is the social side of co-operation. The members realize that by getting together, bringing their families and employees together and meeting one another, they can foster a spirit that will produce an understanding and establish the organization on a firm basis. This year an outing which will take the form probably of a picnic, is planned, and it is hoped to have all the plumbers of Hamilton and their wives and families in attendance. The Hamilton Association plans to go even further than this in the development of the social end of its work. Working from the basis that it is in the best interests of the Hamilton plumbers to co-operate not only with one another, but with their fellow craftsmen all over Ontario and all over Canada, they plan to get in touch with outside organizations and work with them in solving common problems.

The question of organizing a baseball team from Hamilton plumbers is under consideration, and it is hoped that this nine will be in a position to challenge Brantford and Toronto plumbers' teams to friendly games.

Craft in Windsor Organizing

Eleven Members of Trade Attend Initial Meeting—Addresses by Officers of Ontario Association

WINDSOR, Ontario, plumbers are organizing, and at a meeting held for the purpose of discussing what would be done, eleven members of the trade were in attendance. Michael Bryan was in the chair, and Chas. Paddon was appointed secretary.

A feature of the gathering was the visit of a number of members of the Ontario Society of Domestic Sanitary and Heating Engineers, including Messrs. Harry Farthing, H. Waterman, Fred Gentle, A. S. Purdy, P. C. Mansell, T. S. Kelly, Lew Palter, Harry Weinraub, Fred Wiles, W. Hall and Garrett Frankland, all of Toronto, vice-president George Grinyer, of Guelph, Andrew Malcolm, of Guelph, E. H. Russell, of London, Ont., and Clove Myers, of Stratford, vice-president of the Canadian Society.

Addresses were made by Harry Farthing, H. Waterman, George Grinyer, Clove Myers, Secretary Garrett Frankland and others.

Co-operation was the keynote of the addresses, and the Windsor plumbers were keenly interested in what was told them about the results that have been accomplished by organization in various parts of the province. The various speakers emphasized the importance of all plumbers getting together and discussing matters of interest to the trade. It was pointed out that in this way and in this way only can the problems that are constantly coming up be solved in a manner that will be satisfactory to all.

Secretary Garrett Frankland of the Ontario Association, is holding a series of meetings in different parts of the province with a view to steadily widening the work, forming new organizations and increasing the membership in those already organized. On Friday evening, May 9, he visited Guelph, and discussed organization matters with the Association there.

Mr. Frankland states that all the help necessary will be given to outside points, where organization is contemplated, if they will get in touch with him and let him know what is required.

Why Hold Back on Starting Building

Cost of Materials Should Not be a Deterrent Factor—Early Building Figures Showing Increases—Must be New Standard of Values—Meeting Higher Labor Demands Not Conducive to Lower Production Costs

IT is, perhaps, not a recognized fact, or, at least one that is admitted, but it is, nevertheless, true that building materials, comparatively, are lower than practically any other lines which may be mentioned to-day. Many plumbers are sitting back waiting for prices to come down, when they really have the greatest talking argument to sell goods that there is to-day. Building materials are relatively low in price this year, and to the plumber who goes after business aggressively, there should be abundant opportunity to reap a mighty substantial profit and incidentally encourage a return to building activity such as that experienced a few years ago.

Building Figures Show Increase

Figures, which have been compiled for the first four months of this year, show that there has been an all round increase in building permits issued so far, and that these could be stimulated by a little educational work on the part of the various members of the trade, there is no question of doubt. Figures which have been issued by 21 Eastern and 10 Western cities for the month of April alone, amounted to $5,368,422 in the aggregate, comparing with $2,952,-135 in April of 1918, which is an increase of nearly 100 per cent. The gains are pretty well distributed over the whole list, only 5 of the 31 cities reporting a lesser value than a year ago.

This is a desirable situation, and a very creditable showing, when it is taken into account that Government work on the various buildings and contonments required by the military forces are not a factor in these figures. Building figures during the past three or four years, whereas in some instances showing quite satisfactory totals, were inflated, due to the large volume which was devoted to the requirements of the armies of Canada.

However it can be quite safely said that many plumbers and other dealers, who sell to the various building trades, are sitting back, saying that there is no building, prices are high and still not really having a basis for complaint

when comparative figures are considered.

Why Hold Back on Building?

People to-day are buying meat at 50 and 60c a pound, which four or five years ago cost 20c, or perhaps 25c. People are buying clothing at $50.00, $60.00, or even $70.00 whereas a few years ago $18.00, $25.00, or perhaps $35.00 would represent comparative values. One can go all the way down the list and find that people are actually spending money on other classes of goods. Why then are they not going ahead with building?

If the trade would undertake an educational campaign they could do much to increase their own sales and incidentally work out some of the reconstruction problems which are before the country to-day. Too many retailers and others are content to sit back and wait for business to come to them, whereas business is really just sitting around the corner waiting to be approached. The man who sits back in his office and glooms away about the high prices of goods, when he should be out at the front selling goods, has only himself to blame when business returns do not go up as he would have them.

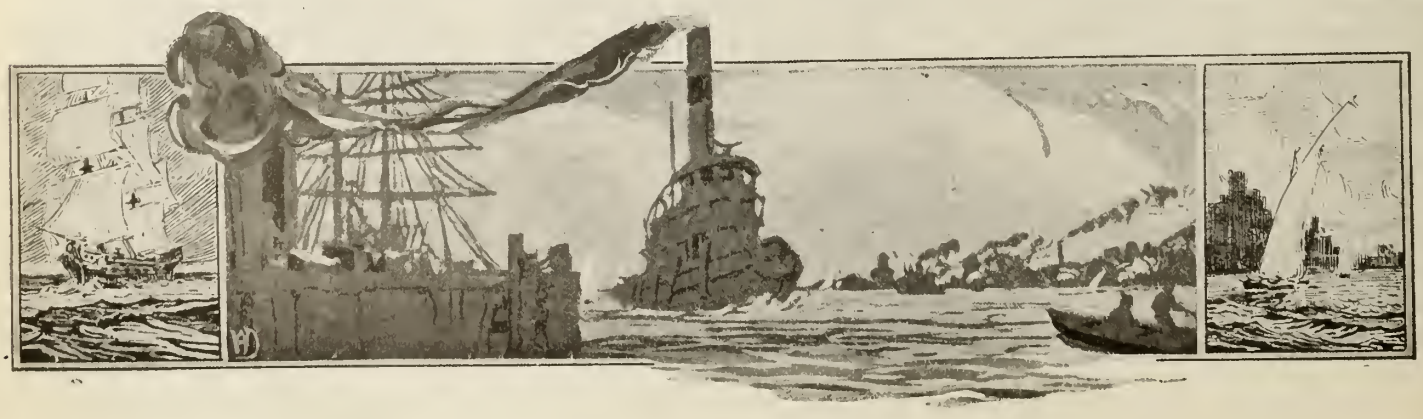
Keep Up Your Stock

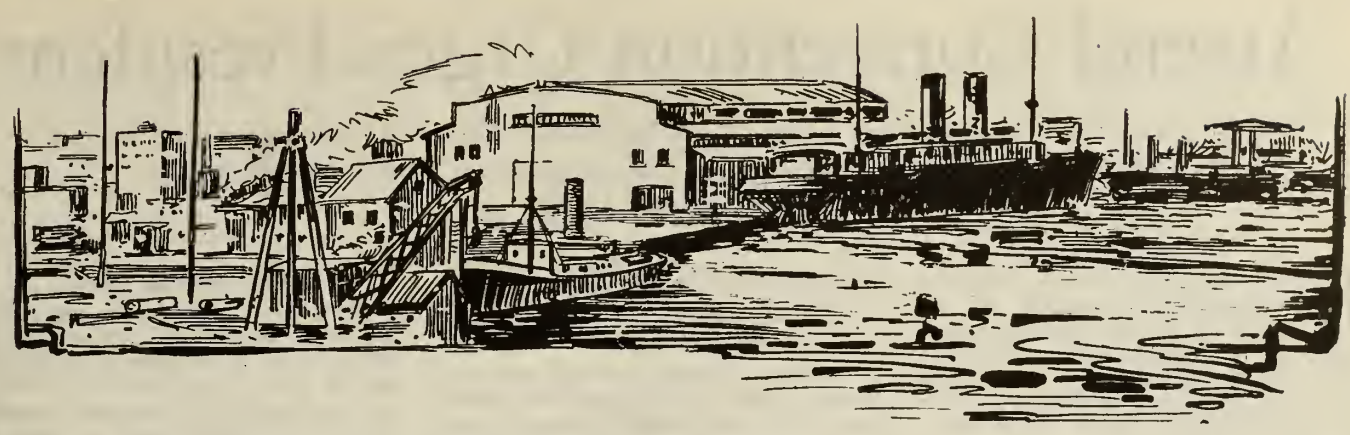
It is not the idea of SANITARY ENGINEER to urge dealers to buy goods in large quantities on what might be termed a more or less speculative basis. However, you cannot get away from the fact that if you starve your stock you must starve your business. This at any time is bad business. It may easily happen that while you are waiting for prices to come down 5 or 10 per cent., you may be losing business which will more than offset any little price decline which may be brought about.

It is true that there have been some lines decline but there has been no general slump reported. The attitude which some dealers have taken is that declines would come in the nature of a toboggan slide. The situation has advanced to such an extent that the trade should be pretty well away from this idea by now, and they should be following up business with a far more confident attitude than they have assumed during the past few months.

The Farmer Able to Pay

To those merchants who serve the farming communities, opportunities to develop business should be many. The arguments in favor of getting the farmer to buy are many. Look over the situation fairly and see what it shows. First, one might emphasize again that





building materials are relatively low in price. It might be well to point out that farm products, which the farmers sell to obtain building material, etc., are relatively high in price. Furthermore, building materials, including lumber, cement and lines more closely associated with the plumbing trade along with labor are not tending towards any material decline during the next year. Last, but not least, it might be well to point out to not only the farmer, but to other interests as well as that they will lose money by waiting to institute what are needed improvements.

During the past three or four years there has been a tendency to let even what should be termed as necessary repair work, slide. This is not a policy that can be continued to the advantage of any property owner for any length of time. This being the case, it might be well to point out that further delay, even should it result in buying a little more favorably, will probably more than be offset by the further deterioration to property.

Just recently a chart of comparative values was prepared by the Portland Cement Association on data supplied by the United States Department of Labor. This chart showed that building materials, by comparison with products of agriculture, mines and industry, are not high priced, and that now is the very favorable time to exchange these products for building. Taking the level of prices as 100 on January 1913, building materials in five years following show an advance of 35 per cent., while the products of agriculture, mines and industry show an advance ranging from about 70 to 105 per cent.

Actual Cost Materials Small

Look at the situation in another way. Take the actual cost of installing a proper plumbing system in a modern house. The cost of the material required when compared with the total value of the house is a comparatively small item. The big item entering into the situation to-day is labor and the demands that are being made by labor men all over the country are such that the price of manufactured materials cannot be readjusted to lower levels indiscriminately.

Take the case of lead products. At the mine lead is cheap, but what enters into the situation from the time mining operations start until you secure a piece of lead pipe. The labor which does the actual mining is securing increased wages; the transportation companies have increased their rates about 25 per cent., so that when the product reaches the manufacturer it has already suffered a substantial increase. The manufacturer is faced with increased production costs through the advances made to labor which have added very materially to the final cost of the finished product which he turns out.

New Standard of Values

It resolves itself into a case where a new standard of values will have to be adopted. It looks very much as though it will take some years before prices will reach a basis which can be termed as normal. That being the case, if the dealer is going to wait until prices reach pre-war levels it looks as though he has years ahead of him before he will be able to do business again.

It is not too much to say that prices cannot return to pre-war values again. There may be an odd instance where goods will decline and perhaps touch a pre-war level, but it is almost sure to happen that a re-action will occur and that these goods will finally be adjusted to a level considerably above figures prevailing five years ago.

There are abundant opportunities for business awaiting the aggressive plumbing and heating engineers. By lending support to housing schemes, which may be started in your own community; in giving the benefit of your experience in the selection of plumbing and heating systems and by urging builders to get started at as early a date as possible, the dealers will be sure to reap the benefit. There is no reason why delay should be the slogan of the plumber. The man who is out after the business can find it and it is just a case of getting out after it. Business won't come to the plumber, he must develop selling ability, and when he does this he is on the road to a successful operation of the business over which he presides.

What is Labor Situation?

Just consider the labor situation for a moment and see what it reveals. On every side, the demands being made upon the manufacturer call for higher wages. Labor men look at the high price they have to pay for food, clothing and other lines and base their claims accordingly. But, do they look at the other side of the situation, too? Do they realize that when they make these demands for increased remuneration, and get it, that another element to increase the cost of goods has immediately entered into the situation?

It is useless to ask that labor demands for a higher wage scale be met and at the same time urge that lower prices on the manufactured goods become effective. Labor enters into the production figures to too great an extent for such a condition to be brought about.

Working on Narrow Basis

In talking to a large jobber of galvanized sheets and kindred lines, who has been a consistent bear on the market during the past few months, SANITARY ENGINEER was told this week: "I have just returned from visiting some of the large mills in the Pittsburgh district, and while there I was given an opportunity of looking over the cost sheets of two of the largest factors. It was an eye-opener to me, and the mills are having a hard time to come out even on to-day's production costs. I am convinced now, from what I have seen, that lower prices on sheets are not a probability in the near future, if the element of production costs is the only one encountered. I have returned satisfied that present basis is a fair and equitable one, and will dictate my selling policy on that assumption."

This is only one line; it is more than likely other manufacturers could show comparative figures, which would be no less enlightening. It will be admitted that some classes of material used extensively in the promotion of war in any of its many phases did reach values that were inflated, but with very few exceptions the bubble has been pricked and quotations to-day are down more in line with actual cost to manufacture.

It is not the building material which represents the great proportion of cost in the construction of a house or factory to-day. The main factor is labor, and it should be well to bear this point in mind, for under present conditions it is not going to be possible to erect buildings at a lesser cost with labor demands showing such marked increases.

Attend Convention Urges President

Time is Ripe for Forward Step by Master Plumbers—Attend Convention and Become Informed on Timely Matters — The Plumber a Force for Battering Canadian Living

LESS than three weeks away the forthcoming convention of the Canadian Society Domestic Sanitary and Heating Engineers should be one of the thoughts foremost in the mind and in the plans of all members of the craft from coast to coast. United effort alone will make the convention the greatest success, whereas, if left to the few faithful, there cannot be that measure of success that is desired. Surely the master plumbers and heating engineers of Canada will see to it that this is a record convention, not in point of attendance only but in the measure of enthusiasm which characterizes it.

An Optimistic President

President Alex. Charette, Montreal, is in cheerful mood these days, and he says that the June convention of 1919 is going to be a winner. There is true optimism, and all that now remains, and which is decidedly necessary, is that all officers and members, no matter where they be located, should back the president to the very limit that his ideal may be reached. It goes without saying that the officers associated with the president will not fail him.

"I believe that the plumbers' trade is one of the best, if not the best in Canada," said Mr. Charette to SANITARY ENGINEER. "It is a business that the plumber should pride himself in. Let him remember that and come to the convention with this spirit. It is with him that the health of Canada rests largely, and he has a very important place to fill. Let him remember that health should be placed on a high plane, and if this be borne in mind the plumber will see what a force he is in the community's welfare."

Are You a Member?

President Charette believes that all master plumbers and steamfitters should join the local organization nearest them, and become members in good standing. "It is only when action is taken in this way," he said, "that the health of communities can be looked after properly. The health of all Canadian cities should be placed on a high plane. It will help much if you come to the convention to discuss these matters. By bringing your ideas and discussing with your fellow craftsmen the problems of the day as relating to the trade, there will be much good to all as a result. Delegates should come prepared to discuss matters freely. The better the discussions the greater success will the convention be."

The time is short for becoming a member of your local if you are not a member already. The active members have a real opportunity now to urge others to become members, and all who can persuade the other fellow who is outside to come inside by joining will be doing a double favor: one to the new member and one for the good of the cause. All should constitute themselves a committee of one to increase the membership, for there is not only strength in union, but there is power in numbers, if they be rightly minded. So, brothers all, take a day off and persuade Bill and Tom to come with you, and sign up. It's a great opportunity.

The Fighting Spirit

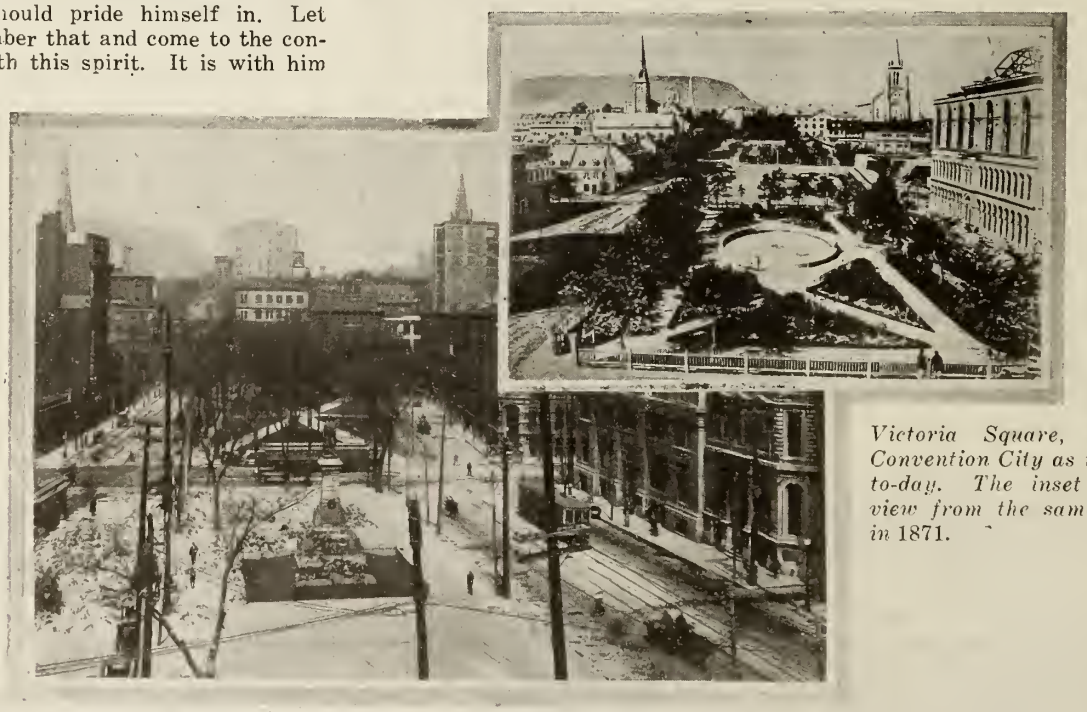
"You have fought in the Great War, and for all that which it stood for. The war, we must be thankful to say, is over, but the war of business is still with us, and we, as plumbers, should remember that we must fight hard to make our trade a success. There will be a big lot of building in Canada and a great many new problems, and the plumbers will need to consider these. The convention hall is a fine place to meet and discuss these matters. We should take advantage of every opportunity to make the trade what it ought to be, and co-operation on the part of all will accomplish this. Every plumber should boost for his own trade."

This sentiment of the president ought to be carefully pondered. It is not sentiment only, it is sound and constructive common sense which members of the craft will appreciate. His advice is most timely.

Indications are excellent, the president said, and some encouraging letters have been received. Other replies to invitations are earnestly looked for.

A Busy Secretary

While the executive at Montreal has been faithfully holding meetings it must be remembered that Secretary John Watson has had a big budget of correspondence to attend to, and he has been answering enquiries and giving out necessary information and facts right along. Some have not answered the repeated requests made by him, and this



Victoria Square, Montreal, Convention City as it appears to-day. The inset shows a view from the same location in 1871.

has but added to his work, requiring the doubling, trebling, and in some cases quadrupling of his written messages to dilatory officers far away. The response has been better of late, he states, and if those at a distance who have been prevented from writing will come to the convention there is no doubt that a welcome smile and a right glad hand will await them, for the Dominion secretary wears a big smile and will be discernible through it on June 4, 5 and 6.

The executive held two meetings during the week of May 5, and others are being held weekly.

"Come Everybody," Says Quebec Vice-President

"What we want is numbers," said J. E Walsh, the Quebec vice-president. "If we have numbers we shall have a good convention, there is no doubt about it. All plumbers will be welcomed whether they are delegates or not. The same free discussion on all questions will be extended to all, and the only difference is that the delegates are permitted to vote. We want a big attendance.

"Come with ideas and be prepared to discuss the questions that are brought up. Bring up questions of interest to the trade and there will be no doubt as to whether the convention is a success."

Mr. Walsh looks for a large representation from Ontario, and he also expects that Quebec will do well. It is a time when the boys ought even to make a sacrifice, if necessary, to get together on the topics that should interest all. Free discussion on the convention floors will clear the air and send all back with a new determination, a new purpose.

MONTREAL WELCOMES

Montreal will be declared a free city to the members of the craft if the spirit of President Charette prevails. His geniality will make all delegates feel at home.

Great assistance has been given the executive committee in its recent meetings, when preparations were under consideration for the convention by J. E. Walsh, elected to fill the vacancy caused by the death of the late R. J. W. Hughes. Mr. Walsh has had wide experience in convention matters in the past, and his assistance now is greatly valued by the president and secretary.

If you have never visited Montreal you have the biggest Canadian city yet to see. If you have visited it you will be glad to come again. Montreal leaves a good taste in one's mouth, and as a convention city it holds out many advantages. As far as the plumbers of Canada go, "The latch string's out."

Convention quarters are centrally located. They are within a few minutes' reach of Windsor and Grand Trunk stations. Easy access to the wholesale and retail sections of the city is also to be had. A real welcome awaits you at headquarters and you'll be sorry if you don't come.

From far-away Alberta come greetings and the best of wishes, Vice-President Marr of Calgary wishing the convention every success. The good taste of the convention held in Alberta several years ago still lingers. It savored of true Western spirit.

CONVENTION PROGRAMME

The programe for the convention of the C. S. D. S. and H. Engineers, to be held on June 3 and 4, 1919, at 101 Burnside Place, Montreal, is now available. This is as follows, and members are asked to keep the topics before them:

Programme

Tuesday, June 3

9 a.m.—Meeting of executive committee.
Reading and review of sub-executive work.

2 p.m.—Official opening of convention.
1. Report of credentials committee.
2. Appointment of special committee.
3. Reading of officers' reports.

8.15 p.m.—Theatre party.

Wednesday, June 4

9.00 a.m.—Opening session.
Reports of special committees.
Nomination of officers.
Selection of next place of meeting.

2.00 p.m.—Unfinished business.
New business.

4.00 p.m.—Reception supply house representatives.

8.00 p.m.—Paper on "Modern Vacuum Gravity Return and Home Steam Heating," by Mr. A. J. Dickey, general manager C. A. Dunham Ltd., Toronto, assisted by Mr. A. Kastello, manager Montreal office (illustrated with slides).

Thursday, June 5

9.00 a.m.—Election and installation of new officers.

Afternoon and evening—General entertainment.

God Save the King

Message From Saskatchewan President

President Roantree, of Saskatchewan Association, Outlines Some of the Aims of Body Over Which He Presides—Urges Co-operation on Part of the Trade

Action has characterized these Western members. Read what their president has to say to the trade as a whole.

"The SANITARY ENGINEER.
Toronto, Ont.

Dear Sirs,—On June 3 and 4 in Montreal, the sanitary and heating engineers of all Canada are being called together to their first convention since the Great War. During the time our country was at war, one and all of us forgot conventions and were willing to give our undivided attention to the winning of the war. Now that war has been won our thoughts are turned to reconstruction, and that means organization.

Speaking for the Province of Saskatchewan, we attempted nothing during war times in regard to organizing our province, but after it was over we lost no time in calling all the members of the craft together, and in Regina on February 12 and 13 we formed our first Saskatchewan Provincial Association, with some thirty members present from all parts of the province. The wisdom of such a move was very apparent simply from the very large volume of business brought before the convention to be taken care of during the coming year. It is going to entail some hard work but we have some good workers in our association, and I am satisfied we are together to stay, and will grow stronger each year.

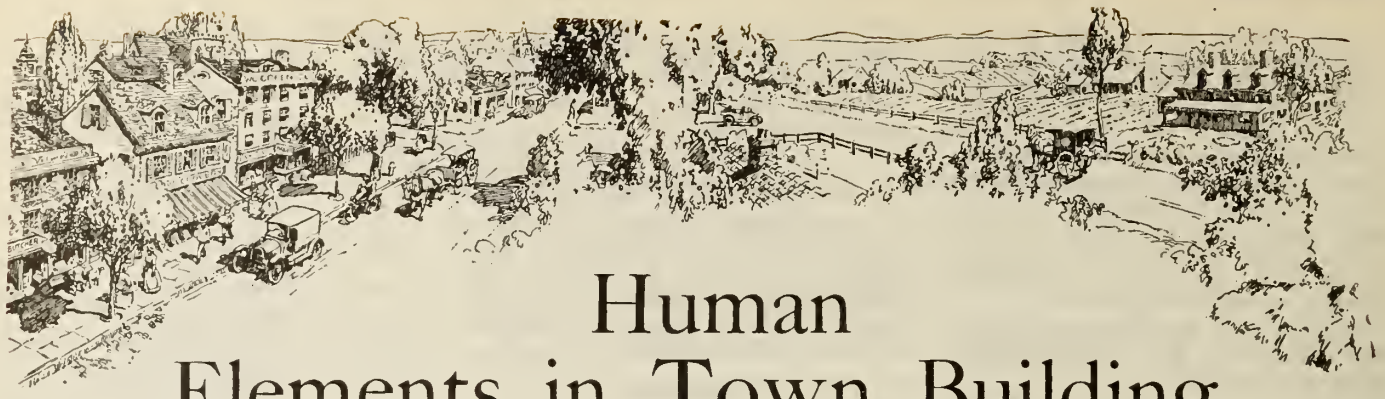
One matter taken up was getting out a uniform price book with both cost and resale prices, kept up to date with change sheets as required; these I understand are now finished and ready to send to our members.

Another matter was taken up and is of great importance—that of plumbing inspectors for the rural part of the province. It is the intention of the Government to appoint several of these inspectors, and we are petitioning the Government to engage practical plumbers for this work, some of our returned men that have been wounded and in such physical condition that they can never again take up their previous work, but would make ideal inspectors.

We are also after some form of technical training in the higher grades of our schools to teach the importance of sanitation as regards the plumbing and heating business as we feel that our business is as much a profession as a mere trade.

There were dozens of other matters taken up just as important as what I have outlined, and possibly more so, but we will not at present go into details. The one thing that I would like to impress on all sanitary and heating men of Canada is the absolute necessity of both forming their local society in every town and city and then form and join up with their provincial association, and with these formed by all means associate with our Dominion society, as the small fee of one dollar per capita tax should keep no one out.

Yours sincerely,
N. B. ROANTREE.
President Saskatchewan Assoc.
of S. and H. E."



Human Elements in Town Building

By A. H. Melville, Madison, Wisconsin. Chief Bureau of Civics and Commerce and Associate Professor of Business Administration, University of Wisconsin.

IN the discussion of problems of town building, problems that are being considered by many municipalities at the present time, there are material considerations to be taken into account without doubt, but above these factors is the far greater factor of the men behind the cities. The accompanying address that strongly urges these points was delivered at the Second Annual Short Course on Merchandising held at the University of Manitoba, Winnipeg.

A TOWN is just as large as the territory it draws business from. No longer can a city hide behind the cloak of its city limits and say—I am not interested in anything except what is within my gates. City limits are only boundaries for municipal government. In building a city, therefore, we must recognize in a constructive way the interests of all the people we serve in commerce, in trade, in agriculture, in recreation, in matters of health. I believe it was the veteran Cyrus McCormick who recently remarked to a group of bankers and business men that the prosperity of farmers in their community is the measure of their sales in business, and the late Theodore Roosevelt, who recently writing in connection with the League of Nations, said: "If this old world of ours is going to be a good place for some of us to live in, it has got to be a pretty good place for all of us to live in."

Our civic, commercial and educational interests are so interwoven and interlocked that we can scarcely consider the welfare of one line of business without reckoning with all the others. If we have factories with efficient working men, they must have sanitary, cleanly homes to live in. They must have recreation for themselves and their families. If we have progressive, contented, satisfied farmers, good farming implements, markets to care for their grain, and modern stores to take care of their household needs are implied.

The Human Touch

In this busy hurly-burly world of ours, this age of wireless telegraph, 100 miles an hour automobiles, 70 miles an hour trains, fast aeroplanes, 90 miles an hour business and three editions a day newspapers, men are losing the personal contact of man to man and the human interest that goes with it. We rush hurriedly to business in the morning and back again at night, to committee meetings, speaking for a moment first with this man and then with that man, but never knowing really the man with whom we meet and deal. We are busy in our stores, we cannot cultivate friendship of our customers. The other day, to my surprise, I learned that a prominent man with whom I have been sitting on committees lived only a stone's throw from my own door. The magic touch of personal interest so common a few years ago seems gradually to be slipping away. And yet, if we are to build our cities constructively, not for to-day or to-morrow, but for years to come, we must know the men who live in them and their capabilities, **for it is men who make cities.**

The other day some misguided man in Minnesota caused the failure of a chain of fourteen banks. The newspapers heralded it half way across the continent. Not a few people immediately said to themselves, "I wonder if my bank where I do my business is safe? How about my savings and earnings, are they all right?" and again we see how interdependent business is and how much the success or failure of one unit affects all the others. And not only that, but it affects the town or city in which the failure takes place and its reputation, for cities have a reputation and character just as individuals and firms have.

Now towns are competing with one another for business just as business men in the same line of business compete with one another. A town is known by the reputation of its business men, by the reputation of its schools, by its libraries, by its health, by its recreation facilities and judged accordngly. If we are to build a town, we must know its resources and liabilities. We must take stock of what it has to offer to the people who live there and who come there to trade, just as the merchant takes stock every so often to see what he has and what he is out of that he must supply. We must analyze our own community critically, face the facts and act according to what the analysis shows. One town is short a good retail store, another a blacksmith shop, another a good hotel.

A Need for Executive Action

A meeting of this kind here to-night fifteen years ago would have been absolutely impossible. Business men did not get together then as now. They feared each other and were not willing to trust their competitors. Perhaps they did not realize the necessity for collective action. No town, or city, or community can be really and truly prosperous and contented unless the people get together frequently in social intercourse and exchange ideas and opinions on matters of public interest and business. Rome and Greece had their public forums at Rome and Athens where the wise and unwise gathered together and debated matters of public policy. For centuries 2,500 to 3,000 years ago this custom prevailed, and who shall say they were not the most progressive cities of their age? The creed of the Athenian youth, the free born British youth can be proud of to-day:

"I am a citizen of no mean city.

"I will never bring dishonor or disgrace upon my city, nor desert my suffering comrades in the ranks.

"I will fight for the sacred ideals and standards of my city both alone and with many. I will respect and obey her laws and seek to impose a like obedience and respect upon the part of those above us who are prone to annul them or set aside. Thus in all ways will I seek to transmit my city, not only not less, but greater, more beautiful and better than it was transmitted to us."

The winning of the world war is the finest example of collective co-operative effort that is recorded in history. One nation could not win the war. Nor could two nations. It took the combined effort of all the liberty loving nations directed under central leadership to strike the blow at militarism which has made the world safe for Democracy. The fruits of the victory we shall enjoy and shall we not carry this lesson of constructive co-operation into our constructive city building?

Two years ago, John Barrett got the Central American Republic together for monthly meetings in the beautiful Pan-American Building at Washington, where the representatives of these countries could meet and know each other, rub elbows, sit at a common table and discuss common interests and common problems in a frank and honest fashion. The result is that instead of a new revolution or war breaking out somewhere in Central America every morning before breakfast, they haven't had a war for two years and a half.

But we must organize if we are to get results. I have noticed that there are three types of institutions in towns that are supposed to represent the business man's, and incidentally the town's, interests:

1. The small business organization designed to give credit information and undertake collections.

2. The business men's organization for developing trade and commerce only and which usually includes the one already named.

3. The big, broad, institution which includes all the interests of the other two and which is big enough and broad enough to include every interest of the country; its commerce, trade, education, recreation, health and agriculture. This is the kind of a body that is building towns for not only to-day, but for the future.

The Men Behind the Cities

Call the roll of cities in the United States and Canada that are doing things

and you will invariably learn that back of them are bodies of educated men that are giving their time unselfishly and generously to building up their cities. Such men have in mind that boys and girls have value in a community as well as wheat and oats, lumber and other commodities. A town which is a better place to rear a family in, a town which is a better place to raise boys and girls in, to develop manhood and womanhood, to build character in, without which business would be as unstable as a rope of sand, is a better place to do business in. And these same men are willing to give some of their time, some of their energy and some of their money to get these results.

Most towns have an idea that a factory is the only thing that can build a town. They forget that towns develop from within out. They want trade and so they buy a factory to come to town to furnish employment for labor and more business. In nine cases out of ten, the factory that wants a location will come to your town if you have the physical requirements for it to run without buying it. And if you buy it, later on the chances are you will find it "a fly by night" and you must pay the fiddler.

A live business men's organization furnishes the facilities for looking into these matters carefully. Let us pass rapidly among our large cities and see what problems they have had to meet and how they met them:

Chicago got her boulevard and park system through the efforts of one of her citizens who appeared before the City Council persistently for ten years. It has been built up commercially largely through an active business men's organization.

Cleveland has become a great city of play grounds through organization. More homes are owned in this city for its population than any other in the United States. A great Union Depot was the result of seven years' effort.

Memphis, through its agricultural committee, is changing the State from cotton to diversified farming. They found that milk was being shipped from Wisconsin to Memphis because they did not have dairy cattle in the State to meet their requirements.

Little Rock—The agricultural committee found that two years ago in Arkansas they were receiving sixty million a year for cotton but were spending seventy-two millions a year for feed that she should have been raising. Since then, 2,900 meetings were held in one year to bring about a change.

In Waukesha, a city of 10,000 people, the business men and bankers loaned farmers money six years ago to buy pedigreed dairy stock and erected a stock pavilion. In 1918 the farmers of this district sold 180 carloads of pure bred and grade dairy cattle amounting to $320,000.

In Ashland the business men and bankers financed farmers after the district had gone to pieces because the lumber was gone. The result was that cheese factories and creameries sprang up all over that district.

At Fondulac, a body of bustling business men invited 1,242 farmers attending a country institution to sit down to dinner with them.

In Wisconsin, seventeen towns from 500 to 2,000 put in rest rooms last year.

"Yes," you are saying, "that is alright, they can do it in towns where they have plenty of money and a paid secretary, but how about small places where little or no money can be raised? How about little towns without any vision?" Mr. Melville then told his audience about a little town of thirty-five people—they did things regardless of population.

Lakefield, Minnesota, accomplished all that it has done through the co-operation of the business men and the farmers. It has a real, live commercial club. It is co-operation and energy that does these things. Never run down your own town, especially to strangers. Boost it, make it the best town in your county—your county the best in your province—your province the best in the country. All we need is more vision, pep and initiative.

VISION

Then vision forth what here you most desire.
Dream of industries and busy marts of trade.
Dream of traffic, dream of wealth, dream of parks and playgrounds—of happiness, content.
Dream of contented labor at its task;
Dream of smiling women and better men;
Dream of homes where laughing children play;
Dream of a city beautiful and fair.
Think and plan as others have for their accomplishments,
Then work, work for contented labor at its task;
Work for smiling women and better men;
Work for homes were laughing children play;
Work for a city beautiful and great, and
Make your city a place where dreams come true.

The Importance of the Cash Discount

Details as to How It Looks Outlined—When Custom Abuses Principle—The Trade Acceptance

WALLACE D. Simmons, president of the Simmons Hardware Co., of St. Louis, has published a pamphlet entitled "The Importance of the Cash Discount in the American Credit System," in which he strongly opposes trade acceptances.

Explaining the origin of the American system, Mr. Simmons says:

"The wholesale merchants who worked out the American open account—single name paper—cash discount system recognized the risk involved in one type of credits as compared with another. They offered to the pioneer merchant of limited capital every assistance and facility to enable him to build up his business rapidly, to make it profitable and to get on a stronger financial footing. They gave him every inducement and encouragement through that course to get in position to pay his bills promptly upon receiving them, and in line with that policy they offered to the man who was in a position to eliminate or minimize credit risks, compensation for so doing. This was a practical, sound and farsighted adaptation of the idea of mutual or group credit insurance. The manner of working it out was somewhat unusual, but the principle was there and the effectiveness. While the situation in this country has changed somewhat, and at present materially differs in some sections, careful study will show that the difference is not so great after all."

Mr. Simmons says that we should keep carefully in mind the principal elements of the cash discount system, which he thinks are the following:

How It Works

First—That the cash discount is distinctly a quid pro quo. It is a price paid for a distinct value received. The quid is the amount of the discount allowed. The quo is the shortening of the period of credit risk effected by the payment of the account on or before a definite date much earlier than its net due date. The discount represents the value of the use of the money for a definite period, plus the value of eliminating the credit risk by final settlement of the account within a period very much shorter than that of its net due period. On terms sixty days, with 2 per cent. cash in ten days, it means that the debtor has the alternative of paying the bill in full sixty days from the date of the invoice, or he has the option of deducting 2 per cent. provided he places the funds in the hands of his creditor, so as to release him from all further risk at least fifty days before the account is due and payable. Two per cent. for fifty days is practically at the rate of 15 per cent. per annum.

When Custom Abuses Principle

There is, however, abuse of the "cash discount" plan to which I wish to refer. At least it seems to me to be an abuse of the principle involved and by those who can ill afford to abuse it—I mean those who offer the discount to others.

I refer to the custom of making the terms of credit so short and the so-called "cash discount" so large, as practically to make the terms net cash. It is either abuse or the evidence of conditions existing in that line of business which create extreme credit risks.

For instance, in some lines of merchandising the usual terms now are 30 days with 5 per cent. or cash in 10 days. That practically means that no man who cannot discount can afford to stay in business. His competitors with more capital, will buy goods under those circumstances so much lower as to make it only a question of time when they will force him out entirely.

A differential of that kind is not a "cash discount" as I see it. It is simply going through the motion of offering a "cash discount" but in reality selling goods on terms—10 days net.

I have no quarrel with the man who makes his terms 10 days net—and hence offers the goods only to those who have or can get ready cash to pay for them. I do quarrel with any plan which makes it very difficult, if not impossible, for any small merchant to do business in this country unless he has sufficient capital to buy all his goods for cash. I am a great believer in giving the able, thrifty, industrious young man of small means a chance to branch out for himself. I believe the American credit system gives just such an opportunity with adequate protection to all interests involved. I believe that plan is in line with one of the basic ideals of

Continued on page 35

EDITORIAL COMMENT

ARE YOU BOOSTING BUILDING?

ON every side one hears the cry when building is mentioned that costs are too high, materials are out of all proportion to enable much construction work to be instituted. But does an investigation of the situation really reveal the fact that building materials are too high? Take the actual cost of the materials entering into the construction of a house. Should the cost of the plumbing and heating used be a deterrent factor—isn't the plumbing and heating bill really a comparatively small factor in the total cost?

What, then, is the main element to-day? Nothing more nor less than labor. With every branch of labor demanding more, does it seem reasonable to expect that prices can come tumbling down? Doesn't labor enter into manufacturing costs to a great degree, far more usually than the raw material? How then is it possible to sanction increased wages to labor and at the same time urge that cost of goods representing the fruits of labor should be reduced?

Putting off building is not going to help the labor situation. Nor is it likely to result in a saving of any great amount to the builder in the matter of the materials which he depends upon the hardware dealer to supply. It is better to face the situation fairly—look at every angle carefully. When you have done this you will be more inclined to urge that building be gone ahead with. The result will be that labor will be employed—it will be a business producer and will stamp you as a citizen who has the best interests of the community as a whole at at heart. If you are not already, start now being a building booster.

THERE is a big difference between practising strict economy and being penurious.

PHONE RATES INCREASED

THE Railway Commission after going thoroughly into the request of the Bell Telephone Company for increased rates has tendered a decision in which the company is given permisson to inaugurate a new schedule for long distance and make an advance of ten per cent. in exchange rates. The Bell Telephone Company requested a twenty per cent. advance for exchange rates. Merchants all over the Dominion are keenly interested in this matter. While there has been considerable objection in many places to any advance in telephone rates it was mainly on the ground that the service rendered was not commensurate with the existing rates. One of the things which many merchants will probably demand if their rates are increased ten per cent. is a greatly improved service. The company in its arguments for making an increase pointed out that rates must be higher if the service was to be maintained. The rates are to be increased, so now the merchants and business men will certainly be justified in looking for improved service. The need for this in some of the rural districts need not be dilated upon. All those who have had any experience in trying to get connections have had reason to remember what occurred. It will now be up to the telephone company to see that these troubles are eliminated.

LITTLE that is worth doing has ever been accomplished without the driving power of enthusiasm.

IT'S WORTH IT

MANY people, including merchants, imagine that it is an easy thing to sit down and write an advertisement. It is anything but an easy proposition to write the right kind of an ad, the kind that will produce sales. It takes time and thought but it is worth the effort every time. There are men who can sit down and write ads easily. There is one thing that makes it easy for them and that is that they know all about the goods. They tell all the good points there are about the goods and they tell them simply and directly. These are the kind of ads that pull. So many writers of ads imagine that in order to inject sales punch into an ad they must use a lot of highbrow words and classy language. There never was a bigger mistake. That sort of stuff goes right over the head of Mr. Average Buyer. He passes it by because he cannot see quickly what it is all about and he reads something that interests him. The most forceful ads are those that are simplest. To write good ads you must know all about the articles you expect the public to buy. The little details often carry the whole interest from the purchaser's standpoint. The best ad writers always make sure that the heading arouses interest. Then they try to make their general talk maintain that

interest throughout. There are certain things every prospective buyer of the articles you are advertising wants to know. Tell them briefly and in simple language. Put in a few illustrations, give the prices, make a nice arrangement and there you are. Study the ads of the best advertisers, the mail order houses and other leaders in advertising and you will constantly get ideas you can adopt. It means work to do this and to keep your advertising message to the public newsy and interesting, but it can be done and the results are worth the effort.

ON A SOUND BASIS

IT is rather gratifying from the standpoint of the trade in general to find so many retail firms suffering from growing pains. At a time like this, the reconstruction period following nearly five years of the fiercest war that has ever been waged, it means a whole lot for the future of the Canadian retail trade to find so many firms whose quarters are too small for them. Business has been and is so good with them that they need larger stores. They are awake to the possibilities of doing a bigger business and are laying their plans for taking on new lines and increasing their turnover in the line they are already handling. "I have never known the retail trade to be on such a substantial basis as it is to-day," said the auditor of one of the largest firms in the Dominion. "The dealers as a whole have come through the war period not only in splendid shape, but better merchants because they have learned so thoroughly how to deal with business problems."

THIS SHOULD BE REMEDIED

IF reports regarding the handling of the British mails after they arrive on this side of the Atlantic are even approximately correct, a situation exists that should be remedied as quickly as possible. The postal service is so closely related to business that quick handling of all mail matter may mean large sums in actual money to many merchants and business houses. Delays are always annoying and costly. Yet it is reported that there is sometimes a delay of from four to five days in mails reaching their destination because they have after reaching Halifax to be sent to New York and then back again. One cause is cited where a steamer carrying British mails reached Halifax on a Saturday afternoon, but the letters from that boat did not arrive in Halifax for distribution until the following Saturday and then by way of New York. Things of this sort point to the need of a new head for the Canadian postal service. Dr. Coulter, who has been in charge for many years, was a village doctor without business or post-office experience. He was given the job over many capable men, men who had grown up with and were thoroughly familiar with the department. The appointment may have been a reward for political services rendered during elections. This sort of thing would not be tolerated for a moment in any progressive private business. The postal service is one of the most important departments that the Government has to deal with and if it were put in charge of a good business executive, and there are any number of good men in the postal service, there would be more efficiency.

IT'S THE NET THAT COUNTS

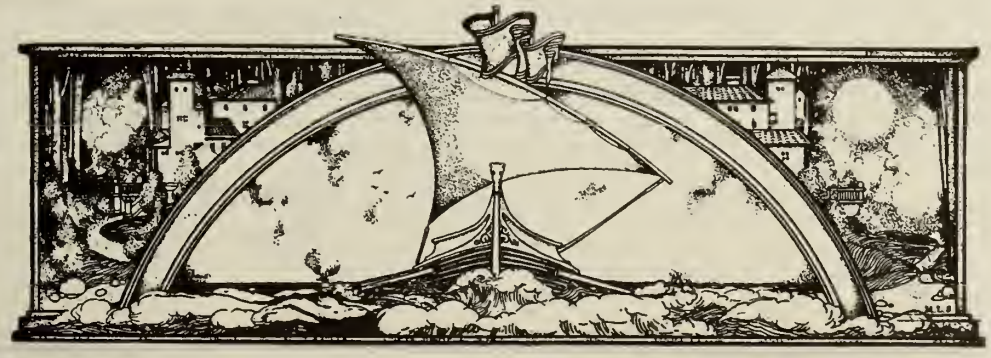
Mr. Dooley was one of the leading restaurant keepers in a small town. Recently he purchased a cash register. The documents of the first trade to be recorded were a 27-cent check and a five dollar bill, the proud proprietor rang up $5.00 and paid out $4.73 in change. When the next customer presented his check it was for 35 cents and a $10 bill was passed over the counter. Dooley operated on the $10 key. Thus things progressed throughout the day. That night, upon checking up, he discovered according to the machine that he ought to have $250.00 on hand, although a careful inventory revealed only $17.30.

"Terrance," said Dooley to his assistant, "have yez taken anything out in the new cash machine to-day?"

"Shure," said Terrance, "I took me carfare home."

"And where d'yez live," inquired Dooley, "Australia?"

Like Mr. Dooley, many a man in charge of a business is ringing up gross profits without the faintest idea of what his net profits really are. And like Mr. Dooley, if he keeps on hammering the gross receipt button, he is "going to have a disappointment in his life," as the fortune tellers say, for after all it's getting the net that counts.



PRACTICAL SHEET-METAL WORK

THREE PIECE ELBOW WITH GUSSET OR GORE PIECE.

BY THOMAS STANSFIELD

THE article for which a pattern is to be developed is that of a taper piece to fit around an iron chimney, which has to be placed through the ridge of the roof. Many times it is found to be a little difficult to flash and make water-tight such a chimney so placed.

The elevation, Fig. 1, is first drawn and the pitch of the roof determined as shown at A B C. The length of the taper is next procured, D E, making A D and E C represent the true length of the taper, with B showing the height of ridge as well as centre of the taper piece.

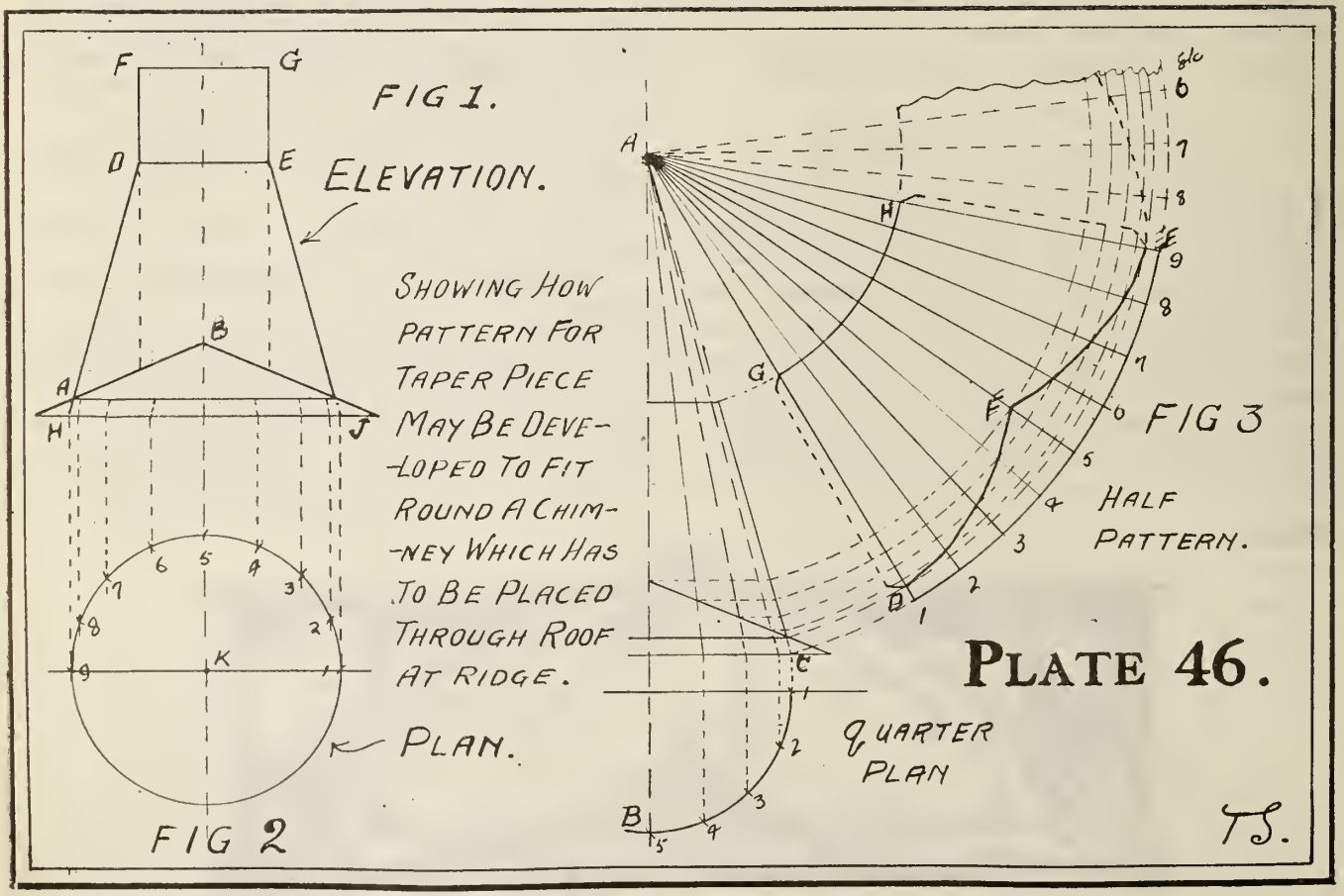
Next draw the plan, Fig. 2, by first extending the line B down to any convenient point, as at K, and using K as centre of plan. Next draw a number of vertical lines down from H to point 9 and J to point 1.

Now divide top half of the plan into equal parts, 1, 2, 3, 4, 5, 6, 7, 8, 9, point 5 being on centre, and erect vertical lines until the solid line H J is reached. This completes the full plan and elevation.

For convenience, a quarter of plan and half the elevation is now drawn, from which the pattern may be developed (see Fig. 3). First draw dotted line A B, which represents the centre, and upon this line draw the half elevation and quarter plan, the exact size of Figs. 1 and 2. In the same manner, and with A as centre, draw an arc from C, which is the stretchout line. Next transfer the measurements, 1, 2, 3, 4, 5, etc., to this arc, and from each of these points draw a line that meets at point A.

Now draw a number of circles as shown by dotted lines, from the various points on side of taper piece, again using A as centre. The solid lines D E F G H show a half pattern, which may simply be turned over at D G or H E on the metal and marked off. The same method is followed out no matter what the taper be, or even the pitch of the roof. Allowance for flash on roof should be made, which is not shown; this would require to be peened down to fit and either riveted, soldered, or both. Allowance is shown for the side seam.

(Continued in next issue)



VENTILATING THE MODERN SCHOOL

Third Article of Series Written Especially For "Sanitary Engineer" by N. A. Kearns—First Article of Series Appeared in April 1 Issue

TO THE person not satisfied with working in a rut, the study of systems of ventilation becomes a most absorbing pursuit, and when in his zeal for the gathering of information he reads every article that comes to his notice that has any bearing on the matter, he is almost sure to be impressed with the general agreement that exists regarding the importance of air movement.

While details of design may differ in their application, we may safely say that there are only two schools of thought differing radically in the opinion of what constitutes air fit for breathing.

One of these schools claims that air once breathed is poisonous because of chemical change that has taken place in its constituents. The other school contends that air can be breathed over and over again if it is properly conditioned by the regulation of its temperature and humidity and by washing it free of odors, dust, and poisonous gases, but no matter how much the representatives of these schools may differ in some of their opinions, they all agree that the air surrounding the occupants of the room must be kept in motion.

Some writers on hygiene claim that a "draught never hurt anyone," and that it is better to sit in the draught than to breathe stagnant air. These men prove their contention by exposing themselves to draughts on every possible occasion and glorying in the fact that they never catch cold, and if we did not know that their other habits were conducive to the building of a vigorous constitution we could believe that they were proving their argument. However, we know that the average person is affected by sitting in a draught, and as it is the average person that we have to provide for we will, if we are conscientious, make sure that the ventilating systems that we are designing will not cause draughts.

One might ask, "What are draughts?" And as in the design of ventilating plants a knowledge of air velocities is required, we will take the opportunity of answering this question by providing the following table:

Feet per Minute	Description
88	Just noticeable
176, 264	Noticeable
352, 440	Gentle breeze
880, 1320	Pleasant breeze
1760	Gale
2640	High wind

Now it will be noticed that air travelling at a velocity of 264 feet per minute is noticeable, so if we have air coming into a room anywhere near the level of the occupants of that room the velocity of the air should not be anything in excess of 264 feet per minute; but if we have made provision for air to enter the room at a point or points situated at some distance from the occupants, say 9 feet above the floor level, we could proportion the fresh air openings so that the air might enter the room at a velocity of from 400 to 500 feet per minute.

If the flue leading to a fresh air face should be small in proportion to the face, a very unequal discharge of air would flow through that face; so we proportion the fresh air flues for an air velocity of from 500 to 800 feet per minute.

When we are using a pressure fan we generally proportion the branches that connect the fresh air flues and the main ducts for an air velocity of from 800 to 1,200 feet per minute.

The main horizontal duct should be proportioned for a velocity of 1,500 to 2,000 feet per minute, this velocity being proportioned to the distance that the air must travel from the outlet of the fan to the outlet in the room. And where the horizontal duct connects to the outlet of the fan it should be of an area equivalent to one and one-fifth of that of the fan outlet.

If we intend to design a gravity system of ventilation, using indirect radiators for the heating of the air and proportioning the air-carrying flues to the usual velocities found in gravity systems, we make use of the following table showing the quantity of air in cubic feet discharged per minute through a flue with an area of 1 square foot. The external temperature is assumed at 32 degrees Fahr. and there is an allowance for friction of 50 per cent.

Excess of Temperature of Air in Flue Above That of External Air.

Height of flue in feet.	10	15	20	25	30	50	100
10	108	133	153	171	188	242	342
15 ...	133	162	188	210	230	297	419
20 ...	153	188	217	242	265	342	484
25 ...	171	210	242	271	297	383	541
30 ...	188	230	265	297	325	419	593
35 ...	203	248	286	320	351	453	640
40 ...	217	265	306	342	375	484	684
45 ...	230	282	325	363	398	514	724
50 ...	242	297	342	383	419	541	765
60 ...	264	325	373	420	461	594	835

Now we have some idea of the things that have a bearing on the proportioning of the sizes of the outlets into the rooms and the size of the vertical flues for either a gravity or a fan system, also the sizes of the horizontal branches and ducts in a fan system of ventilation.

Now we come to the point where we select the fan, and for the sake of illustration we will assume that we are designing a ventilating system for an 8-room school, and that each room has a seating capacity of forty pupils. We therefore have a total of 320 pupils, each requiring 30 cu. ft. of air per minute. The total air requirement is then 12,800 cubic feet per minute. Now it would not be safe to specify a fan of that capacity only. We must provide for the loss occasioned by leakage and friction so we specify a fan with a capacity of 20 per cent. in excess of the actual requirements, viz.: a fan with a capacity of 15,360 cubic feet of air per minute.

When we refer to fan manufacturers' catalogues we find that the capacities of fans vary with the speed at which they are run, so before specifying a fan we must decide on the speed best suited for our purpose.

If we run the fan at too slow a speed the velocity of air travel in the main duct will be so low that there will not be sufficient pressure to offset what might be termed local circulation, and again, if the fan is run at too high a speed we are likely to have a noisy installation.

There are several ways that we might take in finding the size of the fan best suited. We might work back from the ducts to the fan, thus proportioning the fan to the ducts, or we could work from the fan to the ducts, proportioning the ducts to the fan selected. In either case we would find that we had decided on the same size of fan.

In an 8-room school the horizontal ducts are not very long and therefore we can assume a fairly low velocity in our main ducts, say 1,500 feet per minute, and as we have assumed that these ducts are to be of an area 20 per cent. in excess of that of the outlet of the fan, we may select a fan with an outlet velocity of 1,800 feet per minute, and a capacity of 15,360 cubic feet of air. There are several other factors that enter into the selection of a fan, but as fan manufacturers, with a few exceptions, design their fans so as to maintain a proper ratio of fan outlet to the diameter of the fan wheel, and to the top speed of the same, we can generally work from the assumption that the fan outlet is properly proportioned.

After selecting our fan we may estimate the amount of indirect radiation required, and here is something that air velocities also have a bearing on. In designing our ventilating plant we must provide for the assembling of indirect stacks in such a manner that the velocity of the air travelling over these surfaces will be neither too high nor too low. Usually in school work we figure that the air should not travel through these heaters at a higher velocity than 1,000 feet per minute.

In a gravity system a velocity as high as this will not be obtained, and it is for this reason that we must increase our indirect radiating surface over that used in a fan system of ventilation.

The article following this describing this in detail, the system of ventilating an 8-room school, will be illustrated with drawings of the work as installed.

RECENT REGISTRATION

The Modern Plumbing and Heating Co. has been registered in Toronto.

The plumbing firm of L. C. Martineau & Co. has been registered in Montreal by Louis C. Martineau.

Heating and Ventilating

THE BOILER

Fourth Article of Series Prepared for Readers of "Sanitary Engineer" by N. A. Kearns

Editor's Note.—This article is the fourth of a series prepared especially for the readers of SANITARY ENGINEER, covering heating and engineering practice reduced to its simplest terms. Readers will find this article on the "Boiler" a most interesting and illuminative one. The first article of the series appeared in the April 1 issue. Descriptions of installations made in different classes of buildings will be given, together with the method used in making the designs for these installations. It is not our purpose to give complicated formulas, but rather to present the simple rules that have been based on these formulas, in such a way that the reader will be enabled to design a heating and ventilating system without having to refer to the data given in engineers' hand-books. The author of these articles, Mr. N. A. Kearns, has designed heating and ventilating equipment for all classes of buildings in practically every province of the Dominion. Some of the buildings were such that the heating and ventilating equipment had to be installed under the most adverse conditions, whereas in other buildings the design for the heating and ventilating equipment was incorporated in the constructional drawings. The fifth article of the series will appear in the next issue.

IN presenting these articles to the readers of SANITARY ENGINEER it has been the writer's aim to take up the various phases of the practice of engineering in what seemed to be the order of their value. It has been, at times, difficult to draw a line which might define the relative importance of any part of the profession, and because of this very difficulty, some of the things written here may appear to be out of their proper order.

The first article covered the use of the British Thermal, or heat units. It was given first place because the writer believed that a thorough understanding of that factor was of the greatest importance to one desiring to study the science of the heating ventilating or refrigerating engineer.

The second article dealt, perhaps in a more or less indirect way, with the faculty of common sense, and the article was entitled "Comparative Standards."

The third article related to chimneys. Many of the heating brotherhood believe that to be the detail most worthy of first place.

If the cost of the material had been the controlling factor in setting a priority of subject matter it is likely that the first article written should have dealt with boilers. It is not because the boiler is less essential than the subjects that have already been written of, that has given it but the fourth place in this series. This article has been put in a fourth place in the series so as to, in some way, accentuate the statement that almost any of the boilers that have been on the market for at least five years have certain merits peculiar to their individual types, and also to the fact that the particular excellence of certain types of boilers may be rendered ineffective because of their installation under the wrong conditions.

A boiler suitable for installation in a small factory might, under different circumstances, be used without fear of failure in a school building, but at the same time a consideration of the requirements for the school heating apparatus might lead one to make a recommendation for the use of a heater differing in every respect to that installed in the factory building.

In the article appearing in this magazine, regarding the ventilation of schools, reference is made to the curse of the closed mind. Some men can never look at anything without visions clouded by prejudice, and until such a time as they cease cherishing their oblique visions they cannot hope to learn anything new.

Prejudice in regard to certain apparatus is at times generated because of some annoyance that these men have had through misunderstandings, either in the way of business with the manufacturers of such apparatus, or an experience they have had in the difficulty of making some particular installation. Prejudice grows fat with nursing, so that even in the face of the success of a certain type of boiler they can only see its faults. Because of the malicious ignorance bred in that type of mind, thousands of dollars are wasted in the making of heating installations unsuitable for certain requirements.

The vigorous work of heating salesman is not always confined to the introduction of their own goods. Often with considerable force they make erroneous statements regarding a competitor's goods, and with fragmentary knowledge and the insolence bred of ignorance, repeat over and over stories of troubles that someone has had with a certain type of apparatus. They do not seem to realize that frequently they miss the purpose of making sales when they spend so much time in worrying over their competitors' troubles. Perhaps there might be some truth in the statements regarding the annoyances that someone has had with a competing boiler, but as a general thing these salesmen could, if they wished to be truthful, place the blame on the conditions of an installation that made that competitive boiler unsuitable for the work.

Occasionally an engineer or an architect is so closely associated with manufacturers of boilers that the so-called "open" specifications are nothing more nor less than a description of one certain type of apparatus. No matter what class of building they may have in hand, they persist in using an old specification as a copy, until its edges grow ragged and its print becomes blurred from constant usage. Often they use the same type of specification because some experience has led them to the belief that one type of boiler is the best for all conditions, and as a result of this, they often specify a boiler suitable only for the use of hard coal in a district where wood and soft coal might be very cheap; or they specify a soft coal-burning boiler in a residential district, where hard coal is easy to get. They might even specify a boiler, whose great merit is that it runs for hours

without attention, in a building requiring heat for only a few hours each day, and that at long intervals.

Recommendations made by the writer are entirely unbiassed. He has no axe to grind, and his belief is that there is no type of boiler on the market to-day that is suitable for every class of building, or for every location.

It is a well-known fact that the more things are specialized for a purpose the less effective they become under unfavorable conditions. We may take, for instance, such a construction as results in the hot gases being broken up into small currents for the purpose of extracting every available heat unit. Now, that in itself is a good feature, but if a boiler constructed on this principle should be connected to anything but a very high chimney, its flue areas in a short time become so choked with soot as to render ineffective its very merits. This is just taken as an example to illustrate that points of excellence may, under the wrong set of conditions, lead to inevitable annoyance.

A volume might be written on the boiler alone. There are so many things to be considered that a study of a lifetime would not place us in a position where we could learn all there was to know about this particular apparatus. Boiler concerns spend thousands of dollars every year in experimental work in an endeavor to increase the efficiency of the boilers that they are selling, but still with all of this they have only proved the existence of a few outstanding guiding principles in boiler construction that the engineer may use in selecting the apparatus fit and proper for the work to be done.

We being interested in heating boilers alone will not attempt to take up in any way the subject of those used for power purposes.

Perhaps it might be well to refer to the rating of boilers before mentioning any type of apparatus now on the market.

Some boiler manufacturers publish two ratings in their catalogues and this practice makes it not only confusing to one when making a selection of the boiler, but it is also misleading to one whose impatience will not permit him to note that the higher reading of the two ratings is based on a low radiator efficiency.

When a boiler is rated at a capacity of 4,000 square feet of direct cast iron steam radiation, it is meant that the boiler is capable of extracting from the fuel the number of heat units that would be thrown off a like amount of steam radiation in a still body of air at 70 per cent. Fahr.

One hundred square feet of direct cast iron steam radiation generally throws off as much heat as may be taken up by ten square feet of heating surfaces in the boiler. But the area of the heating surface alone can not always be taken as a safe guide in estimating the capacity of the boiler, as some forms of heating surface are much more effective than others. As a rule, 10 square feet of heating surface to a hundred feet of radiation is a fairly safe guide.

One of the things we should also take into account in estimating the capacity of boilers is their grate area. While different forms of heating surfaces require different proportions of grate surface, a safe rule to follow is to select a boiler that has a grate area equal to at least one square foot for every 160 feet of direct cast iron steam radiation, or its equivalent. This rule is based on the consumption of six pounds of anthracite coal per foot of grate per hour. In some of the larger sizes of boiler the rating is sometimes based on a consumption of eight pounds of coal per hour; and it can be said that with proper firing these boilers will develop steam to the full rate of capacities; but as most heating boilers are fired in a careless manner, it is not safe to figure for more than six pounds of coal per foot of grate.

Remember that boilers are rated to supply a certain amount of heat at their outlets and that a factor must be allowed for the loss of heat occasioned by the distance that the heat must travel from the boilers to the radiators. An allowance from 20 to 40 per cent. of the net radiation should be added to the actual load on the boiler to provide for this necessity.

Boilers used in hot water or steam heating systems may be of any of the following types:

1. The horizontal return tubular; a brick set boiler.

2. The fire box boiler either brick set or portable.

3. Sectional boilers in vertical or horizontal sections, these may be of cast iron or steel.

The horizontal tubular boiler may be used to advantage where soft coal and wood is the best available fuel. They are often preferred by engineers in hot blast systems of heating. The brick setting should be built only by capable mechanics and the setting should be examined at frequent intervals for the purpose of discovering and repairing air leaks that are likely to occur even in an almost perfect piece of work.

The fire box boiler is a horizontal tubular boiler with a water-jacketed fire box formed at the front end. It requires a lower cellar height than the return tubular boiler and can be used for almost any kind of fuel with the exception of the smaller grades of anthracite coal.

The greater number of boilers used for heating purposes is that of the sectional cast iron type. There are many varieties of these boilers on the market, differing principally in the direction of gas travel. An extended description of the different types of boilers would take up a great deal of space, and as manufacturers' catalogues as a rule contain complete description of particular types, we will do no more here than make notes of those things that should be looked for in a good type of boiler:

First—There should be few joints exposed to the direct action of the fire.

Second—All parts should be easily cleaned.

Third—The boilers should have few parts.

Fourth—The fire box should be large enough to permit of proper combustion.

Fifth—If the boiler is to have the attention of a constant fireman, or if it is to be self-feeding, the grate area should be large and thin fires should be maintained. In all other cases the fire pot should be deep, so that a large body of coal can be fed at one time.

Sixth.—They should contain sufficient water, so that in filling the radiators with steam the water line of the boiler will not be greatly lowered. While it is a fact that boilers with a small amount of water will get up steam quickly the boiler containing a larger amount of water will keep up steam longer.

Finally, we may say that before selecting the boiler we should be able to answer these questions:

What kind of fuel is the easiest to obtain?

Is the building in a residential district where soft coal smoke will be a nuisance?

What heating service is required, and is the building to be kept at the same temperature all the time, or is heat only required for only a few hours each day?

What kind of janitor service may we reasonahly expect?

How about room for the installation of the boiler?

There are many more questions that might be taken up before making a decision, but some of the things covered in the foregoing article should be at least the means of drawing the attention of the readers to what might be considered the most important details of the subject.

CATALOGUES AND BOOKLETS

Moline Heat, Moline, Illinois, has issued three most attractively printed data books, "Moline Heat Everywhere," "Moline Heat Everywhere, Supplement A," and "How to Plan and Specify the Univent." The first-mentioned book deals with high-class heating for high-class buildings of every size and character. A section is devoted to "The Evolution of Heating," covering hot air heat, ordinary steam heat, ordinary hot-water heat, and vacuum and vapor heat. In other sections the principles of Moline heat are discussed in detail, and many attractive illustrations are shown. The supplement A deals with the application of Moline heat to large buildings, groups of buildings and factories; live or exhaust steam, district heating, ventilating systems, dry kilns, etc. How to Plan and Specify the Univent is offered to architects and engineers as a ready reference and aid in preparing plans and specifications for the Univent for heating and ventilating systems.

The Standard Heating and Plumbing Co., Ltd., of Edmonton, Alta., have been awarded the plumbing and heating contract for the new tubercular hospital being erected at Keith, Alberta, by the Dominion and Alberta Governments.

News from Here and There

CONTRIBUTIONS OF NEWS GLADLY ACCEPTED

PERSONALS

John W. Bruce, of Toronto, general organizer for Canada, of the United Association of Journeymen Plumbers and Steamfitters of America, is in Winnipeg with the Industrial Commission, of which he is a member. This commission will visit various cities and investigate working conditions, and it is expected later will present a report to the Government.

Dan Bethune, of D. A. Bethune, Ltd., 483 Bleury Street, Montreal, was elected by the executive, as vice-president of the Montreal Master Plumbers, to fill the vacancy caused by the death of W. R. J. Hughes last winter. The appointment is doubtless a popular one, Mr. Bethune having returned recently from serving at the front.

MONTREAL PERSONALS

Martin Quigley is better. That will be good news to his friends, for Martin was suffering from a bad attack of neuritis. It was necessary to spend about three months in the hospital, and Mr. Quigley is still taking electric treatment in the hope that a complete recovery will be enjoyed. During his convalescence Martin went to New York. Some city, he says, and still he looks well. While in the Southern metropolis Martin could not keep his curious bump at rest. He saw electric radiators in use in some of the self-contained homes, and says they are fine. He remarked to SANITARY ENGINEER that he believed that, contrary to the general belief, a revolution in heating systems would come about within a comparatively few years, electricity being the medium.

Jos. Laurier is improving in health. His illness has been long and severe, and Mr. Laurier has many friends who will wish for him complete recovery.

There is a better spirit abroad in Montreal, and the plumbers are much more hopeful of the future. A considerable amount of new work is looming in sight, and general jobbing is more active. The plumber and the heating engineer are going to have their innings, and they are entitled to it for they have waited patiently for several years for the really good pickings.

At the annual meeting of the Canadian branch of the Royal Curling Club, held on April 26, suitable allusions were made by its members to the removal by death of the late W. J. R. Hughes, of the Caledonian Curling Club, and who died suddenly during the progress of a game last winter.

Charette and Frere, 416 Ontario Street East, Montreal, have made an improvement in their store by having their office enclosed. There is a glass front and sides and two entrance doors are provided.

Jim Griffin, chairman of the entertainment committee for the June convention, was away for a brief time last week, and it is stated that he will have some good fish stories on tap for the delegates. SANITARY ENGINEER has not been able to locate the "fishing grounds," but there may yet be a real fishing trip in prospect. Several of the Montreal stalwarts accompanied "Jim" on this eventful journey up-country.

TRADE NOTES

Marchessault Bros., of St. John's, P.Q., have purchased 134-136 Richelieu Street, and intend to establish a plumbing and tinsmithing business there as well as carrying motor specialties and selling gasoline.

Cotter Bros., of Winnipeg, have secured the contract for the plumbing and heating in the new power house, Tuxedo Military Hospital.

The sanitary conditions in St. Catharines came up for discussion before the Board of Health of that city this month. Dr. D. V. Curry, the Medical Officer of Health, made his report to the board, which showed conditions, especially in the Facer Street and Pelham Road districts, to be very bad.

Montreal is converting three of the boilers at her waterworks pumping station into oil-burning boilers as an experiment. The work is being done by the Imperial Oil Co., and if the experiment proves satisfactory the city will reimburse the company for this work. The Imperial Oil is supplying the necessary oil. There are fifteen boilers at the pumping station, twelve of which are continually in operation.

CHARLES E. WATSON WAS A LUCKY MAN

John Watson, head of the firm of John Watson & Co., sanitary and heating engineers, Montreal, wore a big smile last week, for it brought the climax of a long separation from his son, Bombardier Charles E. Watson, who has been "doin' his bit" over there since 1916.

As a corporal, Mr. Watson Jr. enlisted. Connecting himself with the McGill or Seventh Siege Battery, he went overseas, and has been there continuously ever since, getting back to "blighty" for a brief time, but following the job of soldiering with the same earnestness of purpose as he used to "throw the lead."

Surely this man was born under a lucky star. He was in the first big fight at Vimy Ridge, and was not even wounded. Men were blown to nowhere at his side. Steadily he continued to serve the great cause and to dodge the bullets. He has returned, none the worse for his experience, and will join his father in his old business at Montreal, and to which he will doubtless be glad to again attach himself.

PLUMBERS' ASSISTANCE SOUGHT

The Administrative Commission of the city of Montreal has invited the Master Plumbers to aid in drafting the new city building by-laws. In accordance with this request a committee of three, consisting of Messrs. Ogilvie, Ryan and Charrette, were named to aid in drafting the new laws, to be in operation by January 1, 1920.

SECURING APPRENTICES

There are labor disputes and troubles enough as we all know. Still, there is no reason why the plumber should fail to look upon the future with confidence, and in high hopes of advancement being made.

In speaking the other day with a senior officer of the Canadian Society of Domestic Sanitary and Heating Engineers, he believed that plumbers everywhere should take a real interest in securing the best possible material as apprentices. The trade was a good one to learn, he said, and if the better class of young men were interested in the prospects, he thought better men could be induced to work in the shop.

The problem is a big one, and solution of it can only be made by careful, thoughtful, attention. It would doubtless be wiser to pay a worthy apprentice a salary that would be some inducement. A heart-to-heart talk with the young men you wish to interest might yield good results.

TORONTO SCHOOL BOARD BUILDING SUPT. RESIGNS

E. H. Bishop, Superintendent of Buildings of the Toronto Board of Education, has tendered his resignation after over thirty years of service, due to the determination of some members of the board that no work shall be carried on under

his supervision. This has caused an impossible situation and Mr. Bishop's resignation is the result. A. D. Waste, assistant superintendent; Wilbur Webb, head draughtsman, and Geo. Bachman, architect, also resigned in sympathy with their chief.

Supt. Bishop has signified his willingness to assist in the investigation now being carried on under Justice Lennox, and to complete such work as is at present in hand, otherwise he wishes to be relieved at once.

This takes practically all the heads of the department and can only result in a complete reorganization.

The property committee of the board itself has no plan as yet for the reconstruction of the department, but Frederick Hambly, chairman of the property committee, is in favor of having a practical business man at the head of the department with a practical builder under him.

ALBERTA PLUMBERS MAKE FORWARD PLANS

Continued from page 17

to take into consideration the past lean years for plumbers. If the men should feel that the expense, and the time, now that business is reviving, and needs all their time at home, they will have to be excused, if they cannot see their way clear to leave home just at this time. They know that every dollar and every hour must count and be used to the best and most immediate needs. They may also have the feeling, as the writer has, that the Eastern man will see to it that the Western men take no hurt by anything that the members assembled may do, as the best interests of the trade are mutual. Possibly, by another year, things may be different, and it may then be possible for the East and West to get together and compare notes."

"The best interests of our trade lose nothing by these annual gatherings. It is in the somparing of notes that we can arrive at what is best in the ever-changing conditions of our surroundings. I trust that the coming convention will lose nothing of its usefulness. My only regret is that I will not be able to take advantage of it, by my personal attendance. but I would advocate the attendance of all those who are able to attend.

"It gives me pleasure indeed, to extend to you my word of praise, Mr. Editor, for the very special efforts that you are constantly placing before the readers of your trade journal. the SANITARY ENGINEER, and my best wishes for its continued success."

(Sgd.) JAMES MARR.

THE IMPORTANCE OF THE CASH DISCOUNT

Continued from page 27

our country, one of the prime assets of American citizenship—the chance to prosper and progress to whatever extent each man has in him the requisite capacity, energy and business ability to take advantage of the opportunities which abound in this great republic.

There is another abuse of the "cash discount" which the business men of this country have lately been urged to adopt and which is so full of fallacies that it would take a large volume to cover them all in detail.

The idea is that we should allow the "cash discount" to a man who sends us a trade acceptance. That is simply giving the quid without getting the quo—giving the "cash discount" without getting the cash—giving the value of eliminating the credit risk, and then having it extended instead of eliminated—allowing each customer to borrow money on our credit by endorsing his paper, and then paying him for the privilege of doing so.

For instance, those of us who are doing business on terms of 60 days with 2 per cent. for cash in 10 days are urged to offer to our customers the privilege of sending us a 90 day trade acceptance within 10 days and deducting the 2 per cent. "cash discount." Let us see how that would work out as compared to the present arrangement.

Roughly speaking, about half of our customers discount their bills—it is probably more than half in dollars and cents, therefore we get half of our money within 10 days. We get cash and the transaction, together with the credit risk, is terminated. On the other half, the large majority pay their bills at the end of 60 days. Some few run over a little bit, but the average of the whole, including the half which pays in 10 days, results in about a 45-day credit period with an allowance of 2 per cent. on one-half of the total of 1 per cent. of the whole amount.

The plan we are urged to adopt instead of that, is to allow 2 per cent. to everybody, but to charge them 1½ per cent. interest for 90 days which interest we in turn would pay to the bank. Therefore, we would be out 2 per cent. discount on the whole business instead of 1 per cent.

Then, in order to transfer this loan to the bank we must endorse each customer's note for the full amount of his purchases and wait for an average of 90 days instead of 45 for the closing of the account and our liability and the elimination of the credit risk.

The "cash discount" system provides an adequate means of governing two important factors in domestic trade, one that of enabling the new merchant to take advantage of opportunities, to grow by availing himself of the credit accommodations offered by those firms whose representatives visit him regularly and are personally acquainted with his business, his methods and his likelihood of success.

It also provides amply and correspondingly for the man who does not need credit accommodations, but who can, so to speak, carry his own credit risk.

Against Acceptances

Mr. Simmons argues that the use of the trade acceptance would practically mean the abandonment of the cash discount and says: "If we should allow ourselves to be led to abandon the American systems by substituting acceptances for cash discounts, it would, of course, mean the substitution of the payment by notes for payment by cheques, and if the scheme is worked out according to the evident design, it would mean that for every one of our invoices we would have a note which we would have to pass to our banks for collection, and on each one of which there would be a collection charge. To sum it all up in a nutshell, our American system has proven itself to be a good system—and we would be very foolish to allow anyone to lead us to abandon it.

CEMENT IN PLACE OF LEAD

A report states that the Bureau of Water Works of Portland, Ore., has been using cement in place of lead for the joints of its cast-iron water mains. According to the engineer of the bureau, one pound of cement at half a cent per pound will satisfactorily take the place of three pounds of lead at eight cents per pound, so that there is a material saving in cost. The labor of making the joints, however, reduces this saving, because the cement joints have to be kept wet for from 36 to 48 hours. The joint is first packed with yarn and oakum, and then neat cement is forced in.

"Payment of Freight" Plans Worked Out

The plan of the Canadian railways to go on a cash basis will become effective on June 1. As stated in previous issues of SANITARY ENGINEER, the railways planned to do this on March 1, but the manufacturers and many of the large firms made such strenuous objections to the clause in reference to bonding, that it was postponed. As a result of conferences between members of the Canadian Railway War Board, the railways and the shippers, an understanding has been arrived at by which the objectionable bonding clause has been eliminated. This, it is stated to HARDWARE AND METAL, would have made the whole plan unworkable.

The suggested arrangements are practically an adoption of the plan that has been in use by the Canadian Pacific Railway, and, it is stated, are entirely satisfactory to shippers throughout the country.

Payment within 48 hours, it is stated, will be considered as cash.

Charges on goods shipped from the 1st to the 7th of any month, inclusive, shall be paid on or before the 14th of the same month; charges on goods shipped between the 8th and 14th of any month, inclusive, shall be paid before the last day of that month, and charges on goods shipped between the 22nd and the last day of any month shall be duly paid before the 7th day of the month following.

Market Conditions and Tendencies

Statements Regarding Supplies and Trend of Prices

THE MARKETS AT A GLANCE

INGOT metals provide the most interest in the markets this week. Tin, after remaining quiet for some little time, has responded to a buying movement in the United States markets, with the result that prices moved up from 2c to 4c per pound this week. Lead, after showing decided weakness, has firmed up and a reaction to higher levels is expected. Copper is very strong and the positive attitude of the spelter market would quickly reflect a buying movement in advanced prices.

The position of tin and lead has resulted in an advance in the price of solder amounting to 2c per pound all the way around. Manufactured lead products are held without change, and a somewhat improved demand is noticeable.

Enamelware maintains a firm position and in spite of the feeling among some factors that a revision downward be made, the market maintains a level from which there are no signs of an immediate change.

Buyers returning from the mill districts in the United States within the past few days, come back with the conviction that prices are about as low as they can get on sheets. One factor mentions having gone into actual production figures with one large mill and the revelations were such that he has come back convinced that the market to-day is right in line with costs. Apart from the element of competition there doesn't seem to be any possibility of a revision downward in sheets for some time to come.

TORONTO, May 15.—About the only cloud on the horizon as far as the trade in general is concerned appears to be the labor situation. If strikes develop there is no telling what the consequences will be. A good volume of business is now being handled and numerous inquiries from all parts of the country indicate that a lot of new business is likely to develop. The markets seem to have settled down fairly well and price changes are few. A change which is expected in some quarters, but which so far has failed to materialize, may come in slightly lower prices for enamel goods. Slightly lower prices are now in effect for standard brass steam cocks.

Solder has moved up 2c per pound as a result of higher levels being reached on tin and the stronger tone evident in lead.

Range Boiler Prices Remain Unchanged

RANGE BOILERS.—A fair volume of business is being done and prospects are bright for a good season. Prices show no change, and none are expected in the immediate future. The quotations are as follows:

Range Boilers	Standard	Extra Heavy
30-gallon	$12 25	$14 50
35-gallon	15 00	17 00
40-gallon	18 00	20 00
52-gallon	24 00	28 00
66-gallon	33 00	38 00
82-gallon	40 00	47 00
100-gallon	50 00	58 00

Enamel Firm Despite Predictions

ENAMELWARE.—The view that has been held in some quarters that lower prices are coming for enamelware is still held in spite of the fact that the downward revision has not materialized. Business in these lines is showing some improvement, but is not at all heavy. Quotations show no change, and are as follows:

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Basins, flat back, 14 x 15 in.	6 45
Do., corner, 15 in.	7 15
Sinks, roll rim, 18 x 30 in.	15 05
Sinks, flat rim, 20 x 30	6 47 6 35
Do., 18 x 30	5 62 5 50
Do., 18 x 24	5 12 5 00
Do., 16 x 24	4 92 4 80
Do., 14 x 20	4 25 ....
Closets, oak tank and seat	25 50
Do., enamel iron or white vitro tank	27 50

Steadiness Marks Wrought Pipe

WROUGHT PIPE, BOILER TUBES.—The market on wrought pipe is holding quite steadily. More activity is noted, orders coming through in fairly good quantities and prices shown in quotations herewith are being maintained.

WROUGHT PIPE

Price List No. 39, April 3, 1919

Standard Buttweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
⅛ in.	$ 6 00	$ 8 00	$.....	$.....
¼ in.	4 53	6 66	5 13	7 26
⅜ in.	4 53	6 66	5 13	7 26
¾ in.	5 99	7 57	6 84	8 42
½ in.	7 53	9 66	8 68	10 81
1 in.	11 14	14 28	12 84	15 98
1¼ in.	15 07	19 32	17 37	21 62
1½ in.	18 01	23 10	20 76	25 85
2 in.	24 24	31 08	27 94	34 78
2½ in.	38 90	49 73	.....	.....
3 in.	50 87	65 03	.....	.....
3½ in.	64 86	81 88	.....	.....
4 in.	76 85	97 01	.....	.....

Standard Lapweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
2 in.	$ 27 94	$ 34 78	$ 31 64	$ 38 11
2½ in.	40 66	51 48	46 51	57 33
3 in.	53 17	67 32	60 82	74 97
3½ in.	66 70	83 72	75 90	92 92
4½ in.	88 00	113 00	107 00	132 00
4½ in.	89 00	113 00	107 00	132 00
5 in.	103 00	132 00	125 00	154 00
6 in.	133 00	171 00	162 00	200 00
7 in.	175 00	224 00	211 00	259 00
8L in.	184 00	235 00	221 00	273 00
8 in.	212 00	271 00	255 00	314 00
9 in.	254 00	324 00	305 00	376 00
10L in.	235 00	301 00	283 00	349 00
10 in.	303 00	387 00	365 00	449 00

Terms, 2% 30 days, approved credit.

Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

No Changes in Soil Pipe or Fittings

SOIL PIPE, FITTINGS.—The fact that many of the molders are on strike has not affected the markets nor trade so far, as fair stocks are on hand and all demands are being met. Business has not been heavy, but shows some improvement, and if conditions become more settled, prospects, it is stated, are for a good season. The quotations are:

Medium and extra heavy soil pipe, 2, 3 5 and 6 in.	20%
Medium and extra heavy soil pipe, 4 in.	25%
Medium and extra heavy soil pipe, 2 in. to 6 in.	35%
8 in. extra heavy pipe and fittings	15%

PIPE FITTINGS

Cast iron fittings	20%
Plugs	35%
Bushings	35%
Unions, ¼" to 2½"	50%
Do., 1⅛", 3" and larger	45%
Dart unions, ¼-inch to 2-inch	25%
Do., 2½-inch and larger	15%
Nipples, up to 4-inch	60%
Do., 4½-inch and larger	50%
Do., running thread 4-in. and under	30%
Couplings, 4-in. and under	40%
Do., 4½-in. and larger	20%

MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittings, Class A, lb.	$0 50	$0 60
Do., Class B, lb. net	0 22	0 30
Do., Class C, lb. net	0 14	0 21

Brass Steam Cocks Reduced Slightly

VALVES—.No changes have been made in quotations on steam goods with the exception of brass steam cocks, standard, which are now quoted at net list. Trade in many lines has been a little quiet, although there are numerous inquiries. A good business in ma-

MUELLER

Water, Gas and Brass Plumbing Goods

CANADA'S BEST

We wish to direct your attention to the fact that there is nothing in water, plumbing or gas brass goods practice that we do not manufacture. The test of over 60 years of producing nothing but the very best in these lines conclusively proves that we are the masters of such manufacture.

We are illustrating a few of our various lines and wish to direct your attention to the fact that—

Our 1919 Catalog A is ready for distribution.

WE MAKE:

1—Tapping Machines
2—Corporation Cocks
3—Goose Neck Connections
4—Ground Key Curb Cocks
5—Rapidac Bath Cocks
6—Rapidac Basin Cocks
7—Globe Valves
8—Drilling Machines
9—Regulating Valves
10—Meter Testers
11—Bath Supplies
12—Service Boxes
13—Basin Combinations and many other articles of highest quality.

H. Mueller Mfg, Co., Limited

SARNIA, ONT. CANADA

rine lines is being handled. The quotations are as follows:

Compression work, standard	50
High grade	49
Fuller work, standard	45
High grade	38
Basin cocks, No. 0 standard	40
Nos. 1 and 2	40
Bath cocks, compression	50
Bath cocks, Fuller	45
Flatway stop and waste cocks, standard.	50
High grade	47
Roundway stop and waste cocks, standard	50
High grade	47
Brass steam cocks, standard	Net List
Globe, angle and check valves, standard.	23%
Do., removable disc	22%
Radiator valves, standard	31%
Do., removable disc	Net List
Basin Cocks—	
No. 0 and 1, Fuller pattern	45
Compression	40
Quick opening	50
Globe, angle and check valves, standard, medium pressure	23%
Radiator valves ,standard med. pressure	31%
Radiator valves, removable seat, medium pressure	25

Boiler Tubes Remain Firm

BOILER TUBES.—The market remains firm, and from reports gathered, no immediate change is expected. The outlook for business seems fair and an open market on steel, now generally expected, will, it is thought, improve the situation as a whole. Quotations are now as follows:

BOILER TUBES—	Per 100 feet Seamless	Lapweld
1¼ inch	$27 00	$.....
1½ inch	28 00	.....
1¾ inch	30 00	26 00
2 inch	30 00	26 00
2¼ inch	33 00	28 00
2½ inch	40 00	32 00
3 inch	46 00	38 00
3¼ inch	.....	45 00
3½ inch	56 00	42 00
4 inch	70 00	54 00

Waste Holds; Oakum Unchanged

WASTE, OAKUM. — There is little new to report in the situation on waste. Sales are not large, but the outlook is not considered discouraging by any means. Prices remain at unchanged levels.

The situation in oakum is on a parallel with that of waste. A fair amount of business is being handled at firm and unchanged prices.

	Per 100 lbs.	
Best American	$21 00	$22 00
Clipper, spun	.....	21 00
Do., unspun	.....	10 50
Plumbers' spun	.....	9 50

Sheet Basis Seems Near Bottom

SHEETS, PLATES.—One large factor, in talking to SANITARY ENGINEER this week on the situation in sheets, said: "I have just returned from Pittsburgh, where I was in touch with two very large mills in respect to sheets. These mills took me over their cost sheets and the figures I saw have convinced me that the market is about as low as it will go. I have been a consistent bear on the market for some months past and it has taken this actual insight into production figures to bring me to a feeling that present figures were not too high. I feel now that little, if any, further decline can be made. Most certainly the buyer is not risking much in covering for his requirements for some little time ahead." An open market might create a temporary flurry and bring about lower prices, but the feeling is that no substantial drop, considering costs, can be or will be made effective. Quotations for the week reveal no change. Sales are reported brisk.

BLACK SHEETS—	Per 100 lbs.	
10 gauge	$5 00	$5 45
12 gauge	5 05	5 50
14 gauge	....	5 10
16 gauge	....	5 20
18-20 gauge	....	5 80
22-24 gauge	....	5 85
26 gauge	....	5 90
28 gauge	....	6 00
3-16 inch plate	4 90	6 25
¼-inch boiler plate	4 50	5 80

Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

GALVANIZED SHEETS—		
10¾ oz.	$7 80	$8 10
U.S. 28	7 40	7 70
U.S. 26	7 10	7 40
22 and 24	6 95	7 25
18 and 20	6 80	7 10
16	6 65	6 95
12 and 14	6 50	6 80

An extra is now charged on galvanized sheets, 10¾ oz. and 28 ga., when shipped out in sheets 3 feet wide. The extra charged over prices shown above is 20c per 100 pounds. Other gauges show no change for different widths.

Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

Reaction in Solder; Higher Prices Named

LEAD AND ZINC PRODUCTS.—Prices on solder reacted this week, going up 2c per lb. as a reflection of the stronger feeling in lead and advances made in quotations on tin. Figures now being quoted on solder range as follows: Guaranteed, 35c to 39c; strictly, 33c to 35c; commercial, 30c to 33c; wiping, 29½c to 32c; wire, 36c to 42c.

No change has been made in manufactured lead products, but a better tone to the market is apparent as a result of the improvement in the metal. Business is reported to be good. Range of prices follows:

Lead pipe, lb.	$0 11½
Lead waste pipe, lb.	0 12½
Lead traps and bends	15%
Lead wool, lb.	0 14
Lead sheets, 4 to 6 lbs., sq. ft., in rolls, lb.	0 10¼ 0 12
Cut sheets ½ to ¾c lb. extra and cut sheets to size, 1c lb. extra.	
Solder, guaranteed, lb.	$0 35 $0 39
Solder, strictly, lb.	0 33 0 35
Solder, commercial, lb.	0 30 0 33
Solder, wiping, lb.	0 29½ 0 32
Solder, wire, lb.	0 36 0 42
Zinc sheets, per lb.	0 17

Still "Nothing Doing" Sign in Evidence

OLD MATERIALS. — Scrap yards have had a poor season of it. In fact, since the signing of the armistice there has been nothing worth while in the business, and some of the dealers with large overhead expenses have probably lost money. Range of quotations which can be termed only nominal, follow:

Dealers' Buying Prices—		
Tea lead	....	0 03
Heavy lead pipe	....	0 04
Pipe scrap	....	8 00
Stove plate, per ton	....	10 00
No. 2 busheling	....	8 00
Yellow brass	....	0 06
Red brass	....	0 08½
Light brass	....	0 05
Scrap zinc	....	0 05
Heavy copper	....	0 15
Wrought iron, No. 1, per gr. ton	....	15 00
No. 1 machinery cast	....	14 00
Heavy melting steel	....	9 00

Tin Goes Higher; Lead Stiffens

INGOT METALS. — Tin moved up from 2c to 4c per lb. this week, and seems to be on the upward trend again. Lead, after a period of dullness and weakness, has stiffened, and it looks as though a revision in prices upward may result.

COPPER.—The market at primary points is firmly held, and there seems to be some interest in the metal. Locally, the price has held unchanged at 18c per lb., but the undertone is strong.

TIN.—This metal has reacted as a result of some buying which has developed in U. S. markets after a period of little activity. It looks as though even higher levels may be reached than the 58c to 60c per lb. price now asked.

SPELTER.—There is a better feeling, and it is felt that any buying would result in a stiffening of values, the metal being quite sensitive to any such factor. Price holds at 8¼c per lb. locally.

LEAD.—A reversal of feeling is noted in lead, the undertone to the market strengthening appreciably, though no quotable change has occurred locally, 6½c per lb. being figured ruling.

ANTIMONY. — There is only a fair amount of business being done, but the market is quite firm. The price here to-day is 8½c per lb.

ALUMINUM. — Still uninteresting and little activity reported. A price of about 40c per lb. fits the situation as it exists to-day.

STRATFORD JOURNEYMEN DEMAND INCREASE

Stratford, Ontario, Journeymen Plumbers held a meeting on Sunday, April 27 to discuss the new schedule of prices which they are presenting to the Master Plumbers. The following statement is given out for circulation:

"The rate of pay is at the present time 35c to 50c per hour. The working day is calculated on a basis of ten hours. If the Master Plumbers have decided to change to a nine-hour day the journeyman have not been notified to that effect.

"It has not been the policy to pay time and one-half or double time for overtime work.

"We are asking for 65c per hour for a basic working day of eight hours instead of a 50c to 75c increase as the Master Plumbers have stated."

The demands also include time and one-half for overtime and double time for Sundays and holidays.

WE manufacture a full line of Steam, Vacuum and Combination Gauges, Locomotive and Duplex Gauges.

MORRISON'S Standard Test Gauges, Hydraulic, Altitude and Sprinkler Alarm Gauges, Combination Water Works Gauges.

PYROMETER Gauges, Engineers' Clocks and Revolution Counters, Pressure Gauge Testers, Pyrometers for Bakers' Ovens.

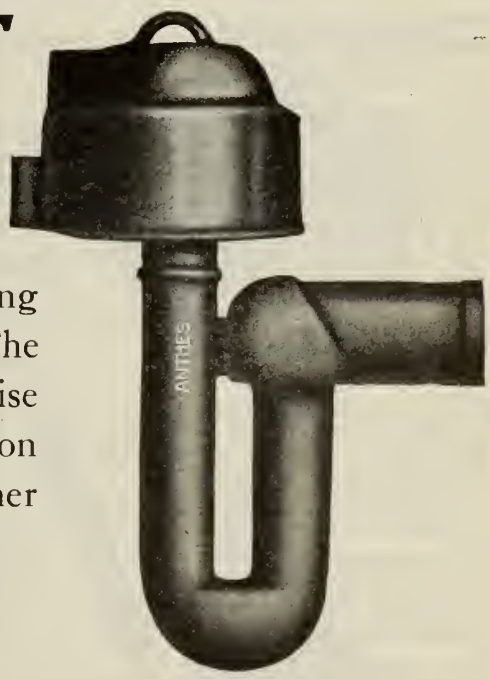
RECORDING Pressure and Temperature Gauges, Blast Pressure Gauges. Dealers in Thermometers for Heating Installations, Feed Water, Flue Gas, etc.

THE JAMES MORRISON BRASS MFG. CO., LIMITED

93-97 Adelaide Street West, TORONTO, ONTARIO

THE FARMER OF TO-DAY

with the natural desire to share in city comforts, is installing the domestic sewage disposal system in his home. The farmer who choses "*Anthes*" syphons and soil pipe is a wise man for he is installing quality. He can be sure his syphon will always act and that his soil pipe will not leak. In other words, he has installed lasting service.



This syphon is made in one piece. It has no joints.

We will furnish you with Septic Tank Blue Prints and Prices on Syphons and Soil Pipe upon Request.

ANTHES FOUNDRY, LIMITED

TORONTO and WINNIPEG

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C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.
United Brassfounders and Engineers, Ltd., Cornbrook, Manchester, England.

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Canadian H. W. Johns-Manville Co., Toronto.
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United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

BOILERS, STEAM OR HOT WATER
Gurney Foundry Co., Limited, Toronto.
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Canada Metal Co., Ltd., Toronto.
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H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.
United Brass & Lead, Ltd., Toronto.

CELLAR DRAINERS
Galt Brass Co., Limited, Galt.
Empire Mfg. Co., Ltd., London and Toronto.
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Trimont Mfg. Co., Roxbury, Mass.
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CLOSETS
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Standard Sanitary Mfg. Co., Ltd., Toronto.
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Empire Mfg. Co., Ltd., London and Toronto.
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United Brass & Lead, Ltd., Toronto.

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C. A. Dunham Co., Ltd., Toronto.

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Canada Metal Co., Ltd., Toronto.
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DRINKING FOUNTAINS
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brass & Lead, Ltd., Toronto.

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Kerr Engine Co., Walkerville.
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Amherst Foundry Co., Ltd., Amherst, N.S.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Limited, Galt.
James Morrison Brass Mfg. Co., Toronto.
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Port Hope Sanitary Mfg. Co., Ltd., Port Hope.
Standard Sanitary Mfg. Co., Ltd., Toronto.
United Brass & Lead, Ltd., Toronto.

ELECTRIC PUMPING MACHINERY
Empire Mfg. Co., Ltd., London and Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
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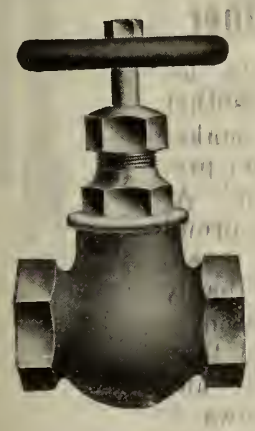

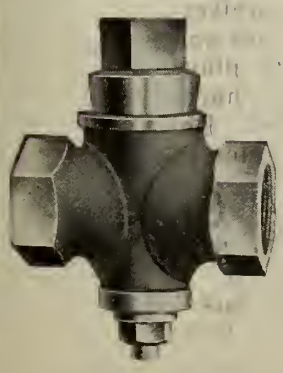

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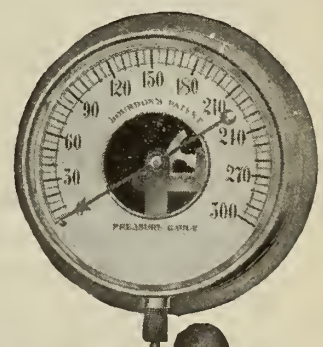
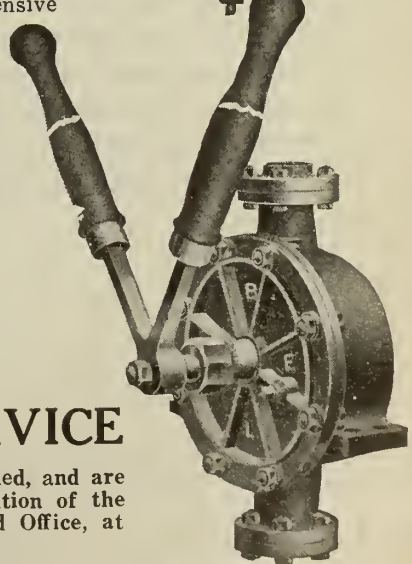
DURING THE WAR our Plants have been exclusively engaged on work of supreme national importance.

WITH PEACE IN SIGHT we are pleased to announce that we intend to again direct our energies to the intensive production of:—

GUNMETAL and BRASS VALVES and COCKS.
STEAM, WATER and COMPRESSED AIR FITTINGS GENERALLY.
CAST IRON STOP and SLUICE VALVES.
SEMI-ROTARY PUMPS.
EXTRUDED BRASS and BRONZE BARS.
BRASS BOLTS and NUTS, STUDS and GENERAL TURNED WORK FROM THE BAR.
CAST AND MALLEABLE IRON COCKS and PIPE FITTINGS.
PRESSURE and VACUUM GAUGES.
INJECTORS and GENERAL JET APPLIANCES.
ENGINE GOVERNORS (Pickering, Proell, and Other Types).
SPRAYING MACHINES, for Insecticides and Lime-washing.
COPPERSMITHS' WORK.
"STELLA" BRAND ALLOYS: MANGANESE COPPER, SILICON COPPER, FERRO ZINC, PHOSPHOR COPPER and TIN, etc.

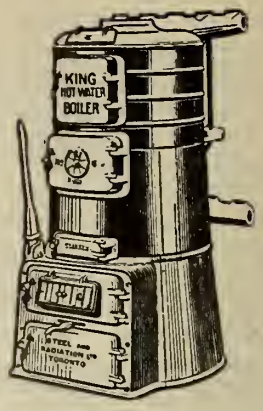




"UBEL" POST-WAR SERVICE

If you are interested in any or all of the lines mentioned, and are in a position to take a hand in the energetic distribution of the same, please communicate with us NOW to our Head Office, at above address.

Recommend to Your Customers Common Sense Heating



A Hot Water Boiler of the correct capacity, with the proper radiation is the most efficient method of heating. It is only by installing the system that will give your customer entire satisfaction that you can hope to get more orders.

KING HOT WATER BOILERS AND IMPERIAL RADIATORS

Give that satisfaction in the highest degree. You can safely stake your reputation on King Hot Water Boilers and Imperial Radiators. Besides the King Boiler is very economical to operate, due to the quick-heating principle of the water-ways.

We require a few live Agents. Write us if you will represent us.

STEEL AND RADIATION, LIMITED

Manufacturers of Hot Water *and* Steam Boilers *and* Radiators; Fenestra Steel Sash *and* Concrete Reinforcing

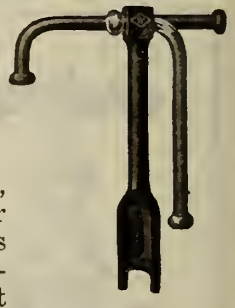
Head Office, Fraser Ave., Toronto

Sales Offices, Montreal and Quebec **Western Agents, The Ashdown Hardware Co., Limited, Winnipeg**

ADVERTISING to be successful does not necessarily have to produce a basketful of inquiries every day.

The best advertising is the kind that leaves an indelible, ineffaceable impression of the goods advertised on the minds of the greatest possible number of probable buyers, present and future.

Williams' Falcon Drop-Forged Waste Plug Spanner



THE old adage tells us, "Necessity is the mother of Invention," but makes no mention of the father; presumably he is "mere man." At any rate, we are rather proud to have "fathered" the invention of the useful and badly needed tool here illustrated.

It is far more efficient than any possible makeshift, and its folding handle allows it to be readily carried in the pocket. The dimensions of the "finger ends" make it universally adaptable to all sizes and forms of basin and sink plugs and grates. The tool is hardened for severe service. Descriptive Booklet on request.

J. H. Williams & Co.
77 Richards St., Brooklyn, N.Y.
THE A. G. LOW CO., LTD.
77 Pacific Ave., Saskatoon, Sask.
Agents for Alberta, Saskatchewan, British Columbia and Manitoba

INDEX TO ADVERTISERS

A. & J. Mfg. Co. 48
Amherst Foundry Co. ..... Inside Front Cover
Anthes Foundry Co. 39
Armstrong Mfg. Co. 48

Beaton & Cadwell 47
Beaton & Corbin 48
Belanger, O., Regd. 46
Borden Canadian Co. 48
Bottum Valve Co. 46

Canada Metal Co. 3
Canadian Consolidated Rubber Co., Ltd. 9
Canadian Tube & Iron Co. 44
Canadian Wolverine Co. 46
Chamberlain Desolvo Co. 46
Consumers Gas Co. 7
Consumers Metal Co. 48

Empire Manufacturing Co. ..... Outside Front Cover

Galt Brass Co. ..... Back Cover and 11
Gummer, G. & W. G., Ltd. 2
Gurney Foundry Co., Ltd. 47

Hause Mfg. Co., Chas. F. 48
Hoyt Metal Co. 44

Imperial City Heaters, Ltd. 4
International Malleable Iron Co. 8

Jardine, A. B., & Co. 9

Katie Foundry, The 44
Kerr Eng. Co., Ltd. ..... Inside Front Cover

Long, R. G., & Co. 7
Lord & Burnham 1

McDougall & Co., R. 45
McIntyre & Taylor, Ltd. 47
Moline Heat 7
Morrison Brass Mfg. Co., Ltd., Jas. 39
Mueller Mfg. Co. 37

Port Hope Sanitary Mfg. Co. 12

Scaife & Sons Co., Wm. B. 44
Standard Sanitary Mfg. Co. 5
Steel & Radiation, Limited 42

Trimont Manufacturing Co. 45
Toronto Hardware Mfg. Co. 47

United Brassfounders & Engineers, Ltd. 41
United Brass & Lead, Limited. ..... Inside Back Cover

Wallaceburg Brass & Iron Co. 4
Warden-King, Limited 45
Wells Bros. of Canada 8
Williams, J. H., & Co. 42

X Laboratories 43

There's Something about an Original that Can Never be Imitated!

IF you've ever heard Harry Lauder sing his Scotch songs you could tell an imitation with your eyes shut.

You've seen Charlie Chaplin do his stunts—do you think an imitator could fool the people?

Whether it's real diamonds or paste—whether it's pure gold or brass—an imitation is simply an imitation—**and nothing else.**

That's why the thoughtful steamfitter isn't going to fall for anybody's talk about something "just as good" as "X" Boiler Liquid. He knows that for positive results it is safer to stick to the original. An imitation of the genuine "X" may look like it—but that's all. Patents are allowed on the "X" Liquid process. Its quality **can't** be imitated. Imitations of the genuine "X" Liquid cause foaming. **"X" will prevent foaming.**

No fitter can afford to experiment with his profits. When you get a leaky or cracked boiler job you want to know that you can send any man to that job—have him finish it quickly—otherwise there's the kicking, the arguing and the time-wasting that is utterly useless from a money-making standpoint.

Over 25,000 steamfitters now know that "X" Liquid is the **only** scientific process for repairing leaky and cracked boilers—and for making them LEAKPROOF—RUST-PROOF — AND SCALEPROOF. They know that with "X" they make three times the profit that they could by dismantling and welding.

And they wouldn't risk their reputations experimenting with an imitation.

"X" LABORATORIES

636 Washington St. Boston, Mass., U.S.A.

The Trade K-T Mark

K-T

FOUNDRY

GALT ONT.

STANDARD

Soil Pipes and Fittings are of pleasing design and good finish. They look good and they **are good**

SPECIALS

Range Boiler Stands are adjustable to 30-35-40 gallon boilers, and you can connect dirrectly under the boiler. Inexpensive but flawless.

Your jobber can supply our goods--if you ask for them

WROUGHT PIPE

BLACK and GALVANIZED SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

All Sizes of NIPPLES (Black and Galvanized)

Ask your jobber for CT *Brand of Wrought Pipe*

CANADIAN TUBE & IRON CO., LIMITED, MONTREAL Works: Lachine, Can.

Steel Tanks for Every Purpose

A FEW "SCAIFE" SPECIALTIES:

Air Receivers
Boilers—Hot Water
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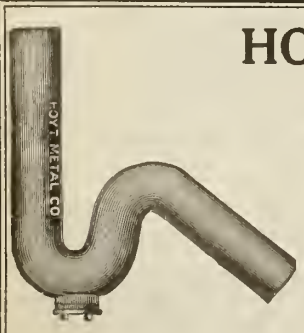
117 years old Founded 1802

WM. B. SCAIFE & SONS CO.

New York, N.Y. Office: 26 Cortland St. Home Office: Pittsburgh, Pa.

HOYT METAL GOODS ARE KNOWN

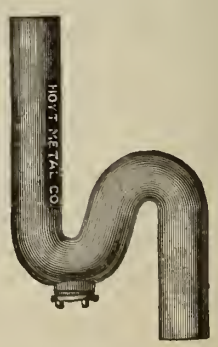
FROM COAST TO COAST



As time-savers there are none equal to our Wiping Solder, Bar or Wire Solder.

Hoyt Lead Traps, bends and waste pipe are in a class by themselves.

All our products are made to formula.



Our Mixed Metal Sales Amount To Over $5,000,000 Annually.

Write your Jobber HOYT METAL COMPANY, TORONTO, ONTARIO *Write Us*

New York, N. Y., London, Eng., St. Louis, Mo.

The Wrench of 25% Greater Efficiency

TRIMO PIPE WRENCH

Two new features have been recently added to the Trimo Pipe Wrench, namely Nut-Guards, in all sizes, and unbreakable steel frames, in leading sizes.

The Nut-Guards prevent the accidental rotation of the nut while in use.

These improvements add 25% to the usefulness of the tool.

The Trimo Pipe Wrench is made with wood handles in 4 sizes, 6-in., 8-in., 10-in., 14-in. and in steel handles in all sizes, 6-in. to 48-in. inclusive.

All Trimo Pipe Wrench parts are interchangeable.

The inserted jaw in the handle can be readily replaced when worn, thus adding to the life of the tool.

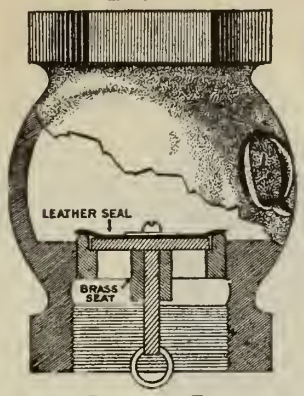
Nut with Nut-Guards

Inquiries from Importers and Dealers Solicited. Send for Catalogue No. 55.

TRIMONT MANUFACTURING CO.

Cable Address: Triwrench
Code: Western Union

Roxbury (Boston) Mass., U.S.A.



This is a "Q" Foot Valve

And it Just *CAN'T* Leak

There are more pump troubles caused by "leaky" valves than from all the wear and tear which occurs in the average life of a pump.

The "Q" valve will overcome all priming troubles, and water once raised above it, through the suction line, will not leak out.

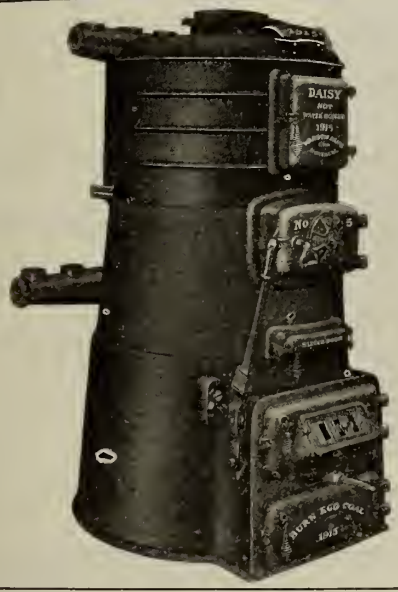
If you want the pumps you instal to give maximum, you will require to use the only valve on the market that JUST CAN'T LEAK.

Made in sizes from 1 to 8-inch.

R. MACDOUGALL CO., LTD.

GALT., CANADA

Over 60,000 Daisy Hot Water Boilers Now in Use Are *You* Selling Your Share?



Daisy Hot Water Boilers are easiest to sell because they have an established reputation for exactly meeting the requirements of the modern home.

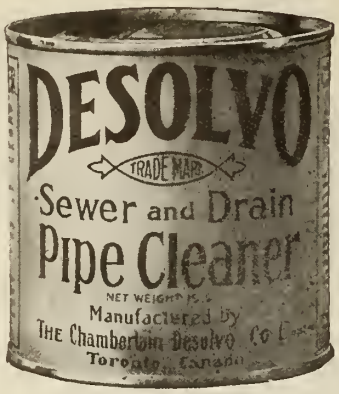
Every Daisy you instal will help build bigger business by bringing repeat orders for installation in neighboring homes later.

WARDEN KING, Limited, Montreal

BRANCH OFFICE: 136 SIMCOE ST., TORONTO

DESOLVO

A Better Job



In Less Time

It readily mixes with cold water. Better have a stock on hand for emergency calls. It cleans clogged waste pipes in a jiffy. Desolvo will save you time and money and get you a satisfied customer.

Order From Your Jobber.

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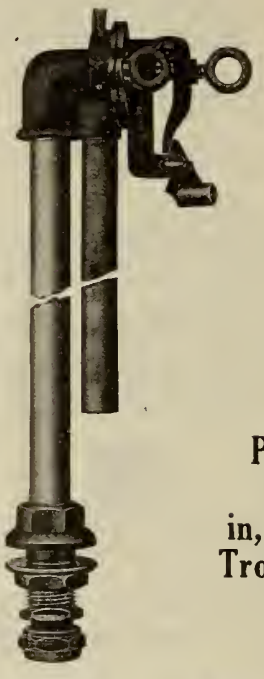
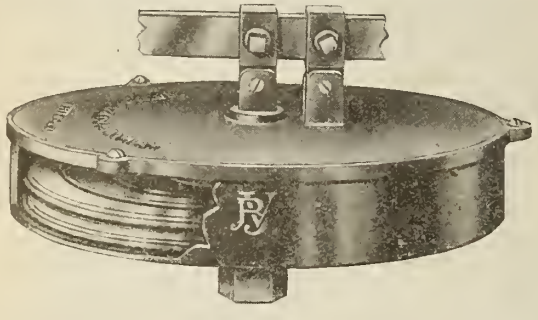
Elevated Pattern



The Ball Cock The Best Plumbers Use

Put the Dale in, and the Trouble out



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The BV Vapour Regulator will lift 25 lbs. on one ounce of pressure.

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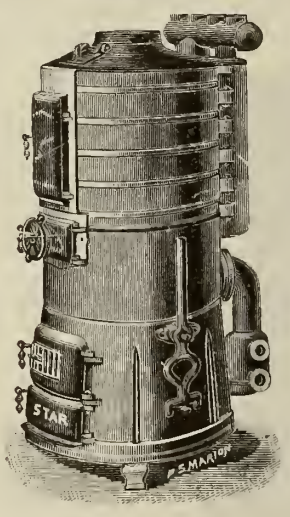
The BV Air Eliminator

Bottum Valve Company

213 W. Schiller Street,

CHICAGO, ILL.

Thousands of Star Boilers in Use requiring repair Parts



It will be a long time before folks forget the coal troubles of the last few seasons.

The principal feature of the Star Boiler is that **no other round hot water boiler has any coal-saving improvement not embodied in the "Star."**

Then, too, while boiler installation and repair time is here, why not stock up with Star parts, for which O. Belanger has taken over the rights and is now making?

Many thousands of Star Boilers are in use requiring these repair parts hitherto unobtainable.

Write to us at once in time to catch the season's business.

We guarantee prompt deliveries.

O. BELANGER, REG'D.

Amherst Street

MONTREAL

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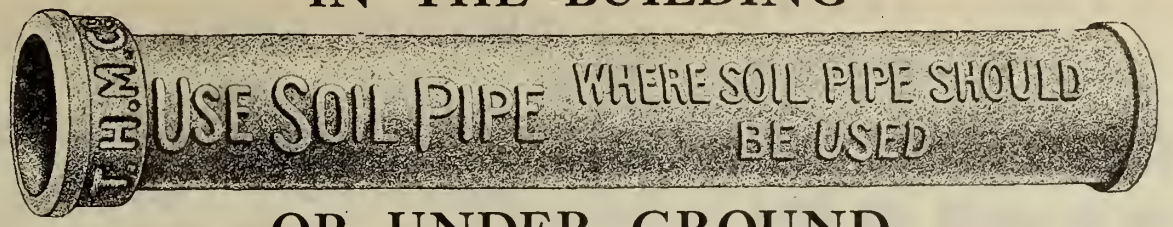
IN THE BUILDING



OR UNDER GROUND

ASK YOUR JOBBER FOR T.H.M. CO. BRAND OF SOIL PIPE AND FITTINGS.

TORONTO HARDWARE MFG. COMPANY, - Toronto, Canada

WE MANUFACTURE A FULL LINE OF HIGH-GRADE RANGE BOILERS

M. & T. COILS

EXTENDED SURFACE

Just take a good look at the design of this Coil. It is an actual reproduction, and will heat more water for its size than any other heater on the market. If you have not yet installed M. & T. Coils, you are the loser. Send in your next order.

Ask your jobber, or write us direct. We can ship on short notice from stock.

McIntyre & Taylor LIMITED

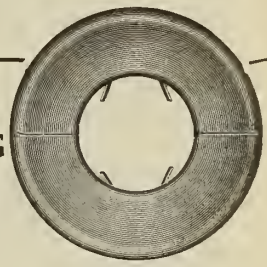
TORONTO
501-3 Queen St. W.

MONTREAL
55 St. Francis-Xavier St.

WINNIPEG
156 Lombard Street

OPEN VIEW
NO. 10-A

The CEILING PLATE that's better



TOP VIEW
NO. 10-A

THE NO. 10—A NARROW FLANGE PLATE—IS A STEEL HINGED PLATE. FLANGES ¾" WIDE. HIGHLY FINISHED. ESPECIALLY DESIGNED FOR TWIN CONNECTION "NARROW."

Gem No. 4.

The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

High quality at the right price.

Gem No. 4 Automatic Air Valve

Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

Write for catalog showing our complete line of specialties.

The BEATON & CADWELL MANUFACTURING Co.

New Britain, Conn.

Eastern Agent: J. R. Devereux & Co., 358 Beaver Hall Square, Montreal. Western Agent: A. E. Hinds & Co., Chamber of Commerce, Winnipeg.

Have You Taken Down Your Sign?

A prominent merchant who has made a great success of all branches of his business has said that withdrawing advertising from a good trade paper is like taking down your sign. Advertising to the trade you serve is business insurance, but premiums must be kept up or the policy will lapse.

There never was a time when the trade was keener for business information. That is why the advertising pages of the SANITARY ENGINEER are being followed so closely at the present time.

GURNEY-OXFORD BOILERS RADIATORS

FOR HEATING ANY DESCRIPTION OF BUILDING BY STEAM OR HOT WATER

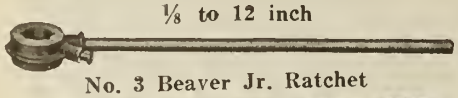
GURNEY FOUNDRY Co. LIMITED

TORONTO MONTREAL CALAGARY WINNIPEG VANCOUVER

BEAVER TOOLS

For Easy Cutting

⅛ to 12 inch



No. 3 Beaver Jr. Ratchet

THE pipe-threading problem is readily solved when **Beaver Easy-Working Die Stocks** are used. They cut quicker and save labor, time and money.

They eliminate troublesome bushings and the bother of changing dies.

Beaver Threaders are easily adjusted. Simply "move the handle—that's all."

Beaver Tools are absolutely guaranteed. The user and the dealer are both protected.

Write us for descriptive circular and prices.

The Borden Canadian Company

110 Church St. - - - Toronto, Canada

GENUINE

ARMSTRONG STOCKS and DIES

Hingd Pipe Vises *Pipe Cutters*

Pipe Threading Machines

—MANUFACTURED BY—

THE ARMSTRONG MFG. Company

317 Knowlton Street BRIDGEPORT, CONN

248 Canal Street NEW YORK

Second-Hand Pipe

1-2" to 4"

Black and Galvanized

Send us list of your requirements

Consumers Metal Company, Limited

14 St. John Street MONTREAL

Works: LACHINE, QUE.

SAVE YOUR COUPLINGS

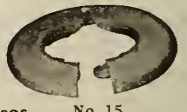
Write us what you have of the various sizes, either in pieces or pounds, and we will make you a cash price on them.

The A. & J. Mfg. Company

559 West Lake St. Chicago, Ill.

"BC" COMBINATION COLD ROLLED STEEL Floor and Ceiling PLATES

Carried by the leading supply houses



No. 15

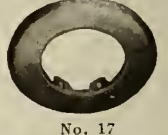
Puts just the right finish on that heating job

Send for catalog of complete line of "B. & C." goods.

No. 1 Valve

Stock carried by our Canadian Representative W. H. CUNNINGHAM & CO. 183 Church Street Toronto, Ont.

No. 16



No. 17

The Beaton & Corbin Mfg., Co. Southington, Conn., U.S.A. The Old Original Company

"HAUSE" PIPE JOINT CEMENT

For steam, water, air, oil, gas, gaskets, etc. The cement that cements. Sets like gum. Allows no leaks.

The Great Value of "HAUSE PIPE JOINT CEMENT" lies in its peculiar chemical properties which permits of its hardening and expanding after the joints are made up. In making up joints it has the same effect as a lubricant on the best graphite, and while the joints may be made and broken readily, a perfectly tight joint is maintained at all times. Comes in 1-lb., 5-lb., 15-lb., 25-lb., 50-lb. cans, 100-lb. barrels. Manufactured in ready mixed and powder form. Ask your jobber for prices, or write us direct.

Made in Omaha, Neb., U.S.A..

Manufactured in Ready Mixed and Powder Form.

Canadian Distributors:

Empire Manufacturing Co., Limited

LONDON and TORONTO

WORTH WHILE PUBLICITY

The general tendency in Canada is towards selling high-grade goods. There never was a time, in the history of the country, when all branches of the Canadian trade were more interested in securing all possible information regarding products they can recommend and guarantee to their customers. Advertisers in SANITARY ENGINEER reach the cream of the trade in all parts of the Dominion.

Plumbers' **"NATIONAL" QUALITY** *Supplies*

Lead Traps — Lead Pipe

Brass Goods

Closet Combinations

Enameled Ware — Boilers — Pipe — Fittings

UNITED BRASS & LEAD LIMITED

TORONTO, CANADA

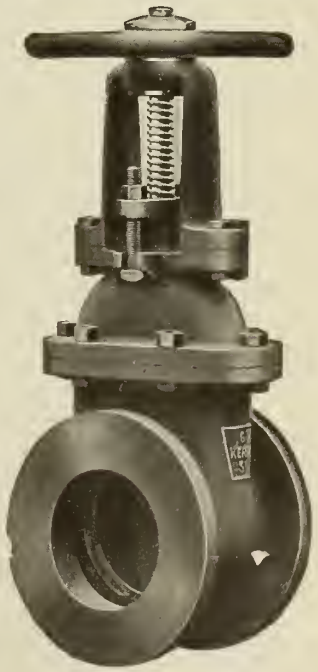
Write for a copy of our new Catalogue

There Are Lots of Gate Valves

Advertised and Sold

but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.
Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.
Approved by the Fire Underwriters' Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

EVERY TANK GUARANTEED

EVERY FITTING TESTED

It Pays to Buy the "VITRO"

The **VitrO Tank** is the careful buyer's choice. It's the tank without a lining. Made from a material that does not absorb moisture. All in one piece. No need of repairs. The "no trouble" tank that's made right and never leaks.

Neat in appearance. Silent in operation.

OUR GUARANTEE

A new tank will be given to replace one that at any time proves defective from either material or defective workmanship.

You should have our **VITRO** catalogue. Write for it. It's FREE.

Galt Brass Company, Limited

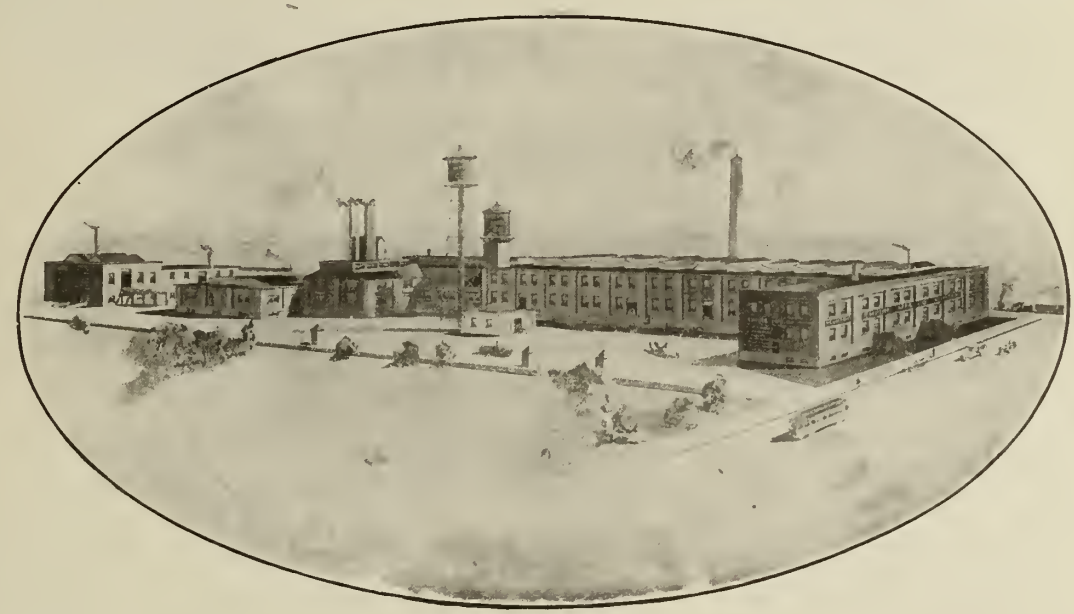
Galt, Canada

Sanitary Engineer

Plumber and Steamfitter of Canada

VOL XIII. PUBLICATION OFFICE, TORONTO, JUNE 1, 1919 No. 11.

Empire Service



A NEW season is opening up—after upwards of four years of more or less retrenchment in general building and construction work, the Canadian Building Trades will this Spring commence catching up on work that has been left undone—work laid aside for more pressing war duties.

This will impose many new problems on the plumbing, sanitary and heating interests, but here is where we offer our services—BESIDES SUPPLYING COMPLETE LINES OF PLUMBING, SANITARY AND HEATING EQUIPMENT, we send our engineers to assist you solve any complex problems that may confront you.

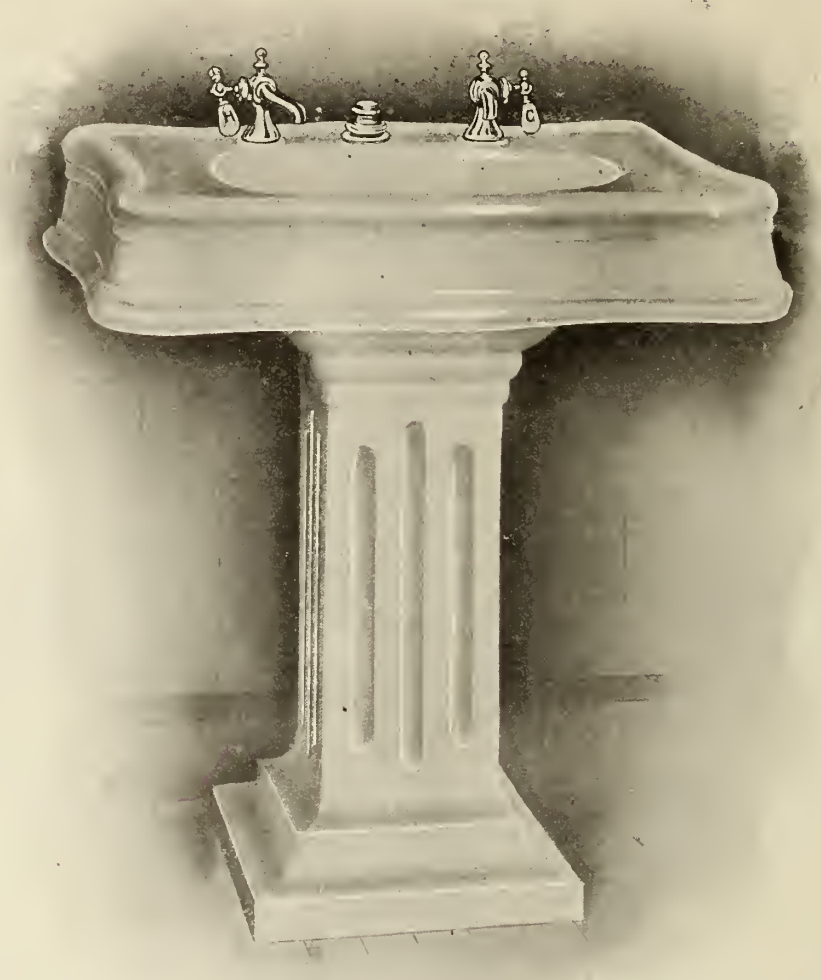
Your problems are our problems, too. It may be the equipment of a new building with the very latest types of plumbing and sanitary facilities. We can help you plan this work. It may be that a building must be refitted—a water pressure system may be needed, or heating facilities found necessary. We offer you expert advice, and can supply EVERY NEED.

Write us for our special Catalogue. Specify your needs. We can be of infinite service to heating and sanitary engineers. We also guarantee prompt delivery.

EMPIRE MANUFACTURING CO., LIMITED

LONDON AND TORONTO, CANADA

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While



A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for BEAVER BRAND CAST IRON ENAMEL WARE

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

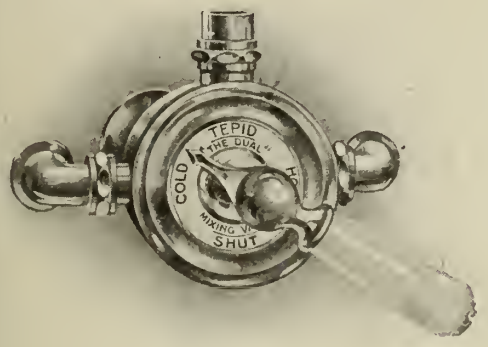
ONTARIO:
Monarch Brass Mfg. Co., 71 Brown St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes, 120 Lombard St., Winnipeg

G. & W. G. GUMMER, LIMITED

EFFINGHAM BRASS WORKS, ROTHERHAM, ENGLAND

And at
9 Fenchurch St.,
London



"Dual" Mixer

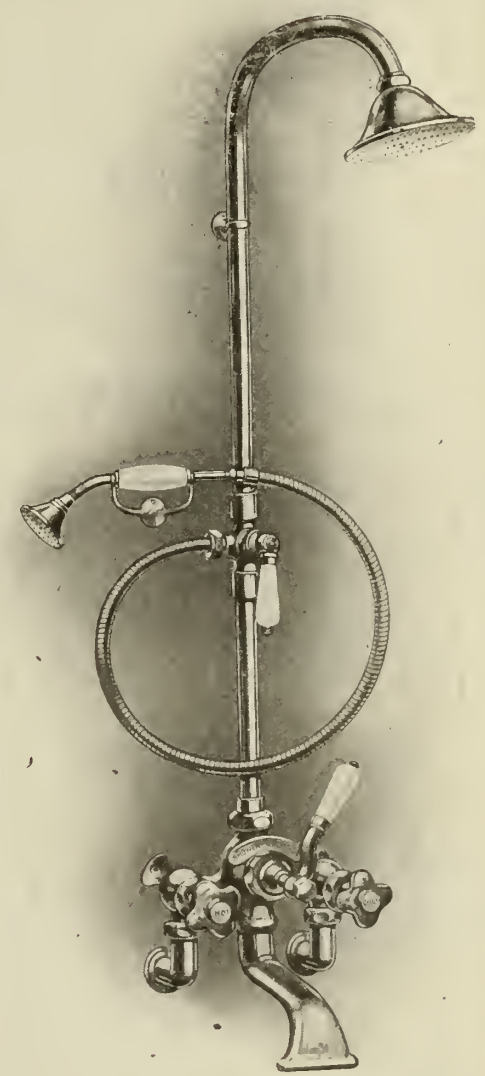
A valve that really mixes Hot and Cold Water, and maintains a uniform mixture.

For ease of operation, simple construction and easy installation, it has set a new standard of efficiency.

Cold Water must be turned on first, no possibility of scalding.

Made in several forms for Showers, Sprays, Operating Rooms, etc.

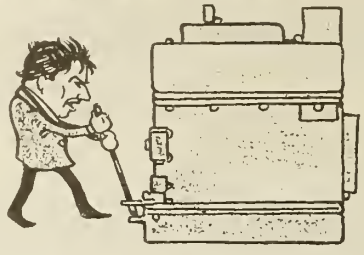
At the well-known works of Messrs. Brunner, Mond & Co. these valves provide baths for 2,500 employees.



G. & W. G. GUMMER, LIMITED

Manufacturers of every description of

Engineers,' Plumbers' and Sanitary Quality Brassware



Grate burn outs— A preventative

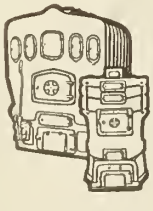
IT'S just plain human nature for a man to get so stirred up over a grate, that he has to lug and tug on to shake, that he unconsciously, or otherwise, leaves the pit choked full of ashes, and if the drafts are left open long enough, the grate burns out.

So that's one of the reasons why we make Burnham Boiler grates shake half at a time, because then they shake half again easier.

Another thing in favor of half the grate shaking at a time — you can run half the fire at a time.

Clinker doors are mostly cramped narrow slits. The Burnham has a wide-mouthed one—big enough to do what it's meant to do.

Burnham Boilers

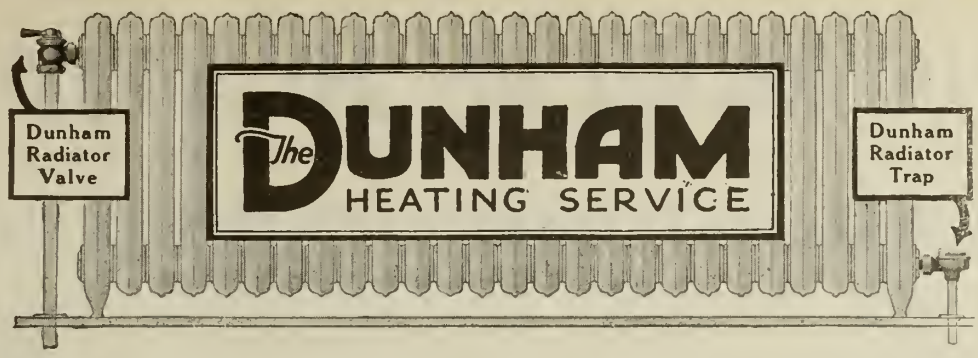


Lord & Burnham Co. Limited of Canada

(Boiler Department)

ROYAL BANK BUILDING, TORONTO

Factory: St. Catharines, Ontario



A Timely Service and the Company Behind It

The public wants better steam-heating service—more comfort per ton of coal. This Company is in a most favorable position to meet this demand through its co-workers—the architects, heating and ventilating engineers, heating contractors and builders—to whom it offers practical co-operation that will increase their prestige as well as their volume of business.

Any man who uses, specifies or installs steam-heating equipment will find it advantageous to learn more about Dunham Heating Service—the product of 15 years' knowledge of steam-heating in all its phases.

C. A. DUNHAM COMPANY, LTD., Toronto, Canada

Halifax, Montreal, Ottawa, Winnipeg, Vancouver, Calgary

"Canadian" Force Cups

CANADIAN CONSOLIDATED RUBBER CO. LIMITED
DOMINION RUBBER SYSTEM
AND ASSOCIATED COMPANIES

The best jobbers sell the Dominion Rubber System products.

No Plumber's kit is complete without a good Force Cup. The time-saving on one job is sufficient to pay for the cup. The Dominion Rubber System produces two styles—the "DOMINION" and the "CANADIAN"—made of pliable rubber that will not crack or turn hard.

Specify "DOMINION" or "CANADIAN" brands and you will be assured of a dependable tool.

Dominion Rubber System Service Branches

Are Located At:

Halifax,
St. John,
Quebec,
Montreal,
Ottawa,

Toronto,
Hamilton,
London,
Kitchener,
North Bay,

Fort William,
Winnipeg,
Brandon,
Regina,
Saskatoon,

Edmonton,
Calgary,
Lethbridge,
Vancouver,
Victoria.

THE MODERN HEATER

Hot Water Heating by Steam

We furnish plans and specifications for Heating and Ventilating Schools and Public Buildings. Central Heating Plants for Groups of Buildings. Laundry and Kitchen Equipment.

Some of the installations we have made, list of many others on application :

Grey Nuns Mother House, Montreal.
St. Vincent de Paul Hospital, Brockville, Ont.
Adam Clark, Hamilton, Ont.
Hagens Convent, Halifax, N.S.
Orphanage St. Joseph, Winnipeg, Man.
Grey Nuns Mother House, Ottawa, Ont.

We solicit enquiries from Architects

Modern Heating & Engineering Co. Limited
83 Bleury Street, Montreal, Que.

WE SPECIALIZE IN

PIPE THREADING TOOLS

Take Another Look At This Job

ESTABLISH PEACE

If you desire to establish lasting peace in your shop, you will have to furnish your men with good tools. Men will not do the same amount of work if that work is hard. The more you *INVEST* in tools if they're good tools, the less you will SPEND in labor. To invest is to establish an asset, to spend is to create a liability. Our tools will save you money and make peace in your shop.

ESTABLISH PROFIT

Work made easy becomes a pleasure. Jardine and Toledo Pipe Threading Tools make threading pipe so easy that a boy can thread a 4-inch pipe as easily as he can thread a ½-inch pipe.

Not only so but when a thread is made with one of our tools it's a good thread. No cutting off pieces of pipe. No lost time and no leaks. That's the way to establish a profit on every job.

A. B. JARDINE & COMPANY, LIMITED, HESPELER, ONT.

Sole makers of "Jardine" Pipe-Threading Tools.
Sole licensees to manufacture and sell Toledo Pipe-Threading Tools in Canada.
Agents, Winnipeg and West—Stanley Brock, Ltd., Winnipeg, Man.
Brockville and East—J. R. Devereux, 358 Beaver Hall Square, Montreal.
Belleville and West—W. H. Cunningham & Co., 183 Church St., Toronto, Ont.

"Standard"
"Perfection" Built-in Baths

Made in One Piece Enamelled All Over

These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in-Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners meaning bathroom sanitation.

Made in 5 and 5½ foot sizes.

Illustrations on request.

Write the nearest dealer

Standard Sanitary Mfg. Co.
Limited

General Office and Factory: Royce and Lansdowne Aves., Toronto, Ontario

Toronto Store:
55-59 Richmond Street East

Winnipeg Showrooms:
76 Lombard Street

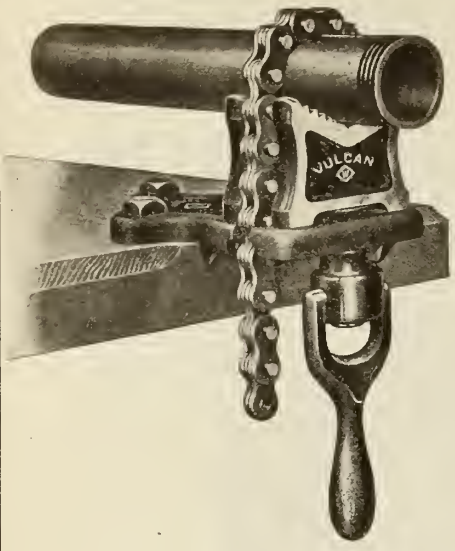
Hamilton Store:
20-28 Jackson Street West

Montreal:
358 Beaver Hall Square

Calgary:
325 Eighth Avenue West

Vancouver:
847 Beatty Street

"MADE IN CANADA"



Williams' "Vulcan" Chain Pipe Vise

THIS Vise is, perhaps, one of the most remarkable of our products. It is the result of many years of careful study and comparison of many pipe vises—their advantages and weaknesses.

Williams' "Vulcan" Chain Pipe Vise in the *only* pipe vise made wholly of wrought steel and is stronger, lighter and more compact than the old style, conventional cast tool it is rapidly superseding. It embodies all the desirable qualities of a really superior pipe vise for it is unbreakable and combines positive grip, powerful action and rapid adjustment with ease of attachment anywhere.

Three sizes—1/8 to 8-inch pipe. Descriptive booklet on request.

J. H. Williams & Co.

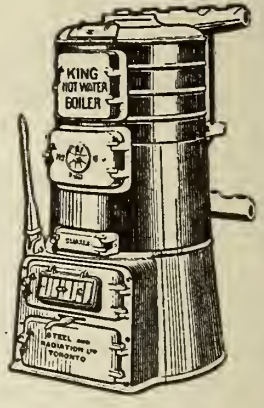
"The Drop-Forging People"

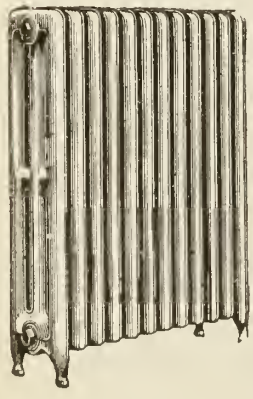
30 Richards Street, Brooklyn, New York

The A. G. Low Co., Ltd.
30 Pacific Ave., Saskatchewan, Sask.
Agents for Manitoba, Saskatchewan, Alberta and Britlsh Columbia

Houses, Factories and Schools

Heating is a most important problem. The "thin waterway" idea, used in King Boilers and Imperial Radiators, insures quick circulation, which causes greater fuel efficiency and less fuel consumption. At the present prices of coal, fuel saving is a most important question. This argument alone is good enough for you to sell your customers a King Boiler in preference to any other make.





KING HOT WATER BOILERS AND IMPERIAL RADIATORS

King Boilers and Imperial Radiators are constructed with great accuracy and carefulness. This insures against dissatisfaction after installation. The new design of the Imperial Radiator is pronounced by architects and persons of discernment to be the most pleasing and artistic and the best seller of any Radiator yet devised.

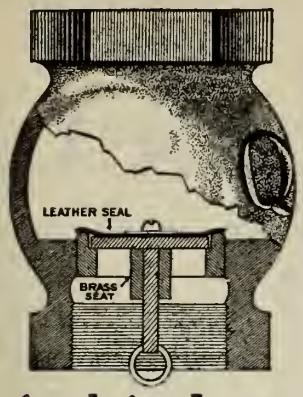
STEEL AND RADIATION, LIMITED

Manufacturers of Hot Water and Steam Boilers and Radiators, Tenesdin Steel Sash and Concrete Reinforcing

Head Office, Fraser Ave., Toronto

Sales Offices : Montreal, Toronto, Quebec. Western Agents : The J. H. Ashdown Hardware Co., Ltd., Winnipeg

Montreal Warehouse Carries Complete Assortment of all Lines.



This is a "Q" Foot Valve

And it Just *CAN'T* Leak

There are more pump troubles caused by "leaky" valves than from all the wear and tear which occurs in the average life of a pump.

The "Q" valve will overcome all priming troubles, and water once raised above it, through the suction line, will not leak out.

If you want the pumps you instal to give maximum, you will require to use the only valve on the market that JUST CAN'T LEAK.

Made in sizes from 1 to 8-inch.

R. MACDOUGALL CO., LTD.
GALT., CANADA

Pipe and the Public Welfare

By R. C. McWane

A Book of the Greatest Value to Every Sanitary Engineer

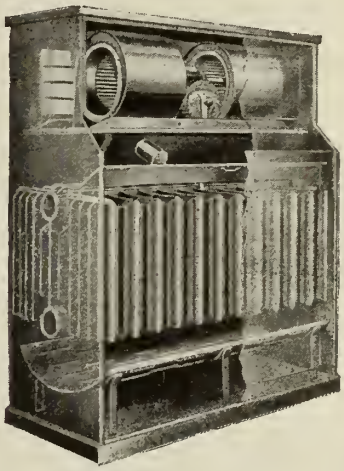
Every sanitary engineer should possess this book. It deals with pipe making of all kinds, cast iron, wrought iron, steel, wood and tile pipe. It is valuable because it gives a true idea of how much service pipe should give under various conditions.

Price $1.00 Postpaid

The MacLean Publishing Co., Limited, Book Dept.
University Ave., Toronto

The
UNIVENT
"LIVE OUTDOORS-INDOORS"

—A Fine Booster For Your Business—



A light, easy job appeals to most men, especially if the pay is better than ordinary.

In the same sense, a light, easy installation of a Heating and Ventilating System appeals to the heating contractor—especially if there is better profit for him.

The UNIVENT installation can be made with fewer men, in less time, with less actual labor than with any other system—and the ultimate profits are greater—and your client is completely satisfied.

It is good, sound business for you to obtain a good working knowledge of the UNIVENT—the most efficient ventilating system in America to-day.

This system is successfully operating right now in hundreds of buildings of all kinds.

Some valuable territory still open for good sales representatives.

Write for our Engineering Data Book and Catalog in colors. They contain information of value to you. Address Dept. G.

Moline Illinois

Why Did We Let Trotzky Go?

THERE was a time when Canada had it in her power to end the war. In the early days of the Russian Revolution a bushy-haired German was taken off a boat at Halifax and interned at Amherst, N.S. He pretended to be a Russian but was known to be in German pay—on his way to push the revolution—British and American Intelligence Officers so informed our authorities. But pressure was brought to bear and the man was finally released. He got to Europe and became the most sinister figure among the Bolsheviki. Largely as a result of his work, Russia dropped out of the war and Germany was able to fight on for eighteen months. That man was Leon Trotzky. His real name was Braunstein.

Why was Trotzky allowed to leave Canada?

Colonel MacLean discusses this question in the June issue of MACLEAN'S MAGAZINE. He tells the story of Trotzky's activities, of his arrest and subsequent release in full detail, tracing the threads of a strange intrigue from Germany to Washington, and Washington to Ottawa. It is a gripping story, the most important inside story of the war.

Other National Features of This Issue

"Victory Stuff" By Robert W. Service.

"Solving the Problem of the Arctic" By Vilhjalmur Stefansson.

"The Gold Wolf" By W. A. Fraser.

"Hobson's Hard Start" By William Byron.

"The Menace in the South" By Agnes C. Laut.

"The Undercurrents" By J. K. Munro.

And a score of other interesting articles.

Secure YOUR Copy EARLY--While Supply Last

Over a Quarter of a Million Canadians Will Read

MACLEAN'S

"CANADA'S NATIONAL MAGAZINE"

20c. — June — 20c.

ON SALE AT ALL NEWSDEALERS

QUALITY

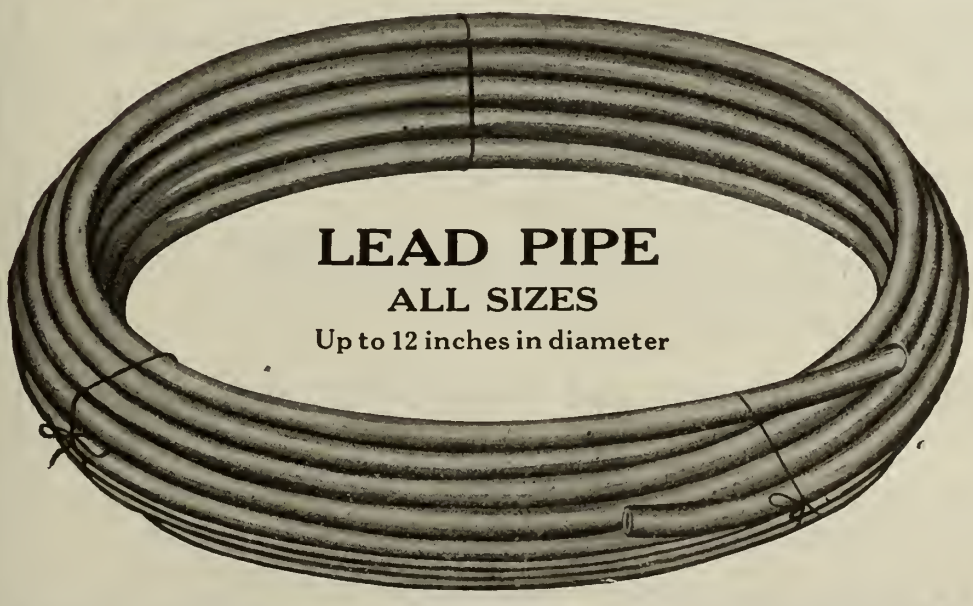
SERVICE

BATHS, LAVATORIES, SINKS, ARISTOCRAT LAUNDRY TUBS

TRAPS AND BENDS, EASY WIPING SOLDER

IRON PIPE AND FITTINGS, ALL BRASS GOODS

LEAD PIPE, SHEET LEAD, BAR OR WIRE SOLDER, BLOCK LEAD, ETC.



THINK

What your reputation is worth

EVERY JOB

Should add to your reputation.

Particular Plumbers

know that C.M.C. Products are not excelled in quality by any on the market.

C.M.C. Products have stood the test

For Over 30 years

We Ship Promptly

Write for Catalogue "A"
It's Free

THE CANADA METAL COMPANY, LIMITED

TORONTO, CANADA

HAMILTON MONTREAL WINNIPEG VANCOUVER

SANITARY ENGINEER

PLUMBER AND STEAMFITTER OF CANADA

ESTABLISHED 1907 PUBLISHED TWICE MONTHLY

Vol. XIII. TORONTO, JUNE, 1, 1919 No. 11

CONTENTS

Names Three Essentials of Success	13-14
Water Meters Great Boon to Plumbers	15
Directors Urge Greater Co-operation	16-17
What One Signboard Conceals—Illustrated	17
Displays and Their Value to Dealer	17
Sees Huge Export Trade Ahead For British Firms	18
Small Town Plumbers Passing Up Business	19
What Others in the Trade Are Doing	20
Cutting Down the Overhead	21
Editorial Comment	22-23
How to Figure by Divisional Method	24-25
Current Events in Photograph	25
Views From Here and There	26-28
The Question Box	29
Heating and Ventilating Systems	30
Ventilating the Modern School—Fourth Article in Series	31-32
Practical Sheet Metal Work	33
The Markets at a Glance	34
Market Conditions and Tendencies	34-36

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Plumber and Steamfitter of Canada

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Names Three Essentials of Success

"Get a Good Stock of Good Goods, Get a Good Location for Your Store and Don't Be Afraid to Advertise"—Views of London, Ont., Dealer Expressed—Goes After Trade Aggressively—Displays a Feature

Based on an interview by C. E. Parsons, of Sanitary Engineer, with F. C. Hunt, of the Hunt Plumbing Co., London, Ont.

"GET a good stock of good goods, get a good location for your store and don't be afraid to advertise."

That is the plan on which F. C. Hunt, of London, Ont., works, and which he says has resulted in his business making a steady growth. There are not many plumbing shops in Canada which have as nice a display window as that in the store of the Hunt Plumbing Co. It has a frontage of forty feet on one of the main streets of London and Mr. Hunt never for one moment neglects to make the most of his opportunity for showing his stock in it. The window display is changed regularly and special care is given to keeping not only the window but everything that is put into it looking its best.

Brings People In

"There is certainly no doubt about the results we get from our window displays," said Mr. Hunt to SANITARY ENGINEER. "They are a big help in selling goods. Any number of people come into the store and ask about the things we show in the windows. They not only ask about them but they buy. Our display windows are certainly one of the most valuable sections of the whole store."

The shop of the Hunt Plumbing Co. is located on a corner. This gives it two windows, the large forty foot window mentioned and a smaller one facing on a side street. The smaller window is used to good advantage also and the displays in it are also changed regularly. It is, however, on the big window that the main efforts are centred.

Store Display Also

Mr. Hunt makes his store arrangement back up in every way the interest that may be aroused in prospective buyers by the window display. The whole front section of the store, forty feet in width, behind the main show window, and extending back for about twenty feet, is used for displaying electrical fixtures, bathroom equipment and plumbing goods generally. The accom-

THE HUNT PLUMBING CO.
HOT WATER HEATING
PLUMBING & GAS FITTING
THE HUNT PLUMBING CO.
THE HUNT PLUMBING CO.
HOT WATER HEATING ELECTRIC FIXTURES

It is not every plumber who has the possibilities for such an extensive window display as the Hunt Plumbing Co., London, Ont., whose store front appears above. However, nearly every plumber has a display window which can be used to advantage and this means of attracting the interest of the passer-by is one which is being developed successfully in towns large and small all over Canada. A well-arranged display of plumbing fixtures reveal as attractive a class of merchandise as any—it would be hard to find an arrangement of goods that is brighter than that above.

A display of this nature does more than create just casual interest—it develops a desire on the part of the individual to have these modern conveniences installed for his own use. The atmosphere is one of cleanliness and that is just the right idea to carry out to influence the buyer to loosen his purse strings. This is the display room of the Hunt Plumbing Co., London, Ont., where the house owner can see just what class of goods he requires to complete the plumbing and heating in his own house.

panying photo will give some idea of how attractive Mr. Hunt keeps this department. As may be seen from the photo a great deal of the interior display is visible to passersby through the main show window. One display helps the other without in any way conflicting. The general effect at night when both the store and the store window are brilliantly illuminated is very striking.

People Like It

"People like to see a nice display of this kind," said Mr. Hunt. "They like to come into a shop where the premises are kept clean and attractive and make a selection. It pays to carry a stock that will enable them to make a choice without having only one or two lines to pick from. We try by our arrangement of the fixtures and plumbing goods to give them an exact idea of how the goods will appear if installed in their own homes. This is a big help in selling. It often gives them ideas that they had not thought about, and they can see how they can alter what they had in mind and make their home better or more attractive. People appreciate suggestions of this kind and also the service that we are able to give them in the way of suggestions about the goods that are best suited to their individual requirements. We always try to get people to buy the best and we find a pretty good response. When we show them a stock such as we carry and show them why a certain line of goods will give them better results, even though it costs a little more to instal than some other line we usually find that they are willing to listen to our recommendations and that they value our advice because we know from experience the results obtained."

Pays to Advertise

"We advertise regularly in the local newspapers, and spend about $700 a year with them. It is money well spent and brings us in a lot of business. We keep our advertising matter changed regularly and always try to keep it interesting. We use illustrations in a great many of the advertisements, usually something bearing directly upon our work or whatever points we are emphasizing in our ads. Good advertising, I think is a most important feature of business, especially where there is goods to be sold such as we handle."

"I regard location as a most important matter. I have changed my place of business several times but have always been on a main street. A good location to my mind is just as important as carrying a good stock and doing good advertising. The man who is in business and has the right kind of a stock cannot get too much publicity. One way of letting people know about the stock is to be located on a street where as many people as possible will see the store and window displays."

People Like Service

In the shop where the plumbing work is done Mr. Hunt has just as much system as in the store. He carries a stock of fittings, pipe, etc., that is ample to meet all requirements. The shop itself is kept clean and orderly, and the tools and the stock are kept in their places, where they can be found at once if required. System of this kind means a lot Mr. Hunt says in saving time which means money as well, especially when one has to meet keen competition.

In spite of the fact that there is an association in London there is a great deal of price-cutting, and nearly everyone in the trade there will tell you that it is one of the worst features of the business to-day. Efforts have been and are being made, with more or less indifferent success, to eliminate this destructive force. It is realized thoroughly by the men in the trade that price-cutting is bad bad business every way it is looked at, not only for the individual who gets a contract by this method but for its effects on the whole trade.

A Patriotic Record

Before the war Mr. Hunt had thirty-one men working for him. When the call came for men for enlistment it was answered by eleven of the staff, and of these four made the supreme sacrifice in Flanders.

Water Meters a Boon to Plumbers

Small Leaks Effect Big Waste Unless Checked—Meter Rates Versus Flat Rates—How Plan is Worked—The Automatic Sprinkler—Avoid Handling Unsatisfactory Meters

THE following article has been contributed by A. E. Beecraft of the Toronto staff of Drummond, McCall & Co., Limited. Mr. Beecraft is a firm believer in the adoption of the water meter plan in all communities as will be noted by the views he expresses herewith. Members of the trade may be more than casually interested in this subject and we would be glad to have any comments from our readers.—EDITOR'S NOTE.

HOW often is a plumber called in to remedy a leaky tap? If your town is metered it may be safe to state, "quite often," as the cautious citizen who has a metered service will see to it that his pipes and faucets do not continue to leak. If the service is not metered, the citizen is liable to say, "Well, let it leak, it isn't costing me anything, as I am charged on the flat rate."

The average citizen does not seem to realize that a round orifice 1-32 inch in diameter (about the size of a darning needle) will pass 345 Imperial gallons of water in twenty-four hours under a pressure of 60 pounds. Once a water meter is put on his service and the careless citizen receives his water bill, he soon wakens up to the fact that the best thing to do would be to call the plumber and have him locate the leak, as many citizens profess not to know where the leak is on their service. It may be an overflowing closet, a leaky tap, or even a crack in the service pipes. So the plumber gets a job which he otherwise might not have secured.

An orifice 1-16 inch in diameter will pass, under 30 pounds pressure, approximately 700 Imperial gallons in twenty-four hours, but when the pressure is raised to 60 pounds the daily leak reaches 1,020 gallons, or enough water is wasted to supply a small hotel. A faucet which is openly spluttering with a leak equivalent to ⅛ inch, will get away with approximately 3,750 Imperial gallons at 60 pounds pressure in twenty-four hours, enough to supply an orphan asylum.

The water leak is unnecessary, and the reliable plumber is the man who knows how to stop this constant waste. If the faucet is so worn it cannot be fixed with an ordinary washer, or by regrinding, here is your opportunity to sell a new tap, as the citizen whose service is guarded by a water meter for twenty-four hours every day is not going to allow this waste to continue uninterrupted if it can be avoided. It is far cheaper to call the plumber and have new equipment installed.

A good water meter is the emblem of honesty, both to the citizen and to your town. When the services are metered the municipality gets paid for the leaks, and the water user is compelled to be honest by keeping his faucets from leaking, or he must pay for his negligence out of his own pocket.

Meter Rates vs Flat Rates

Many municipalities have two rates of charges, the flat rate and the meter rate. The flat rate is rather unfair to the citizen who owns a larger property than his neighbor, as under this system it is difficult to devise any other means of charging for water than by levying a water tax on each and every faucet, bath, closet, laundry tub, hose, sprinkler, lawn hydrant, etc., which may be on the service. This citizen is a greater financial asset to his city, and the flat rate penalizes him for some other person's neglect, notwithstanding the fact that he also pays more taxes on his premises. All the water passing into a city must be paid for, and where the water is pumped it requires motive power according to the quantity used.

The flat rate has a tendency to persuade the citizen not to install many conveniences which he otherwise would, in consequence of which the sales of plumbing equipment are not as large as they might be under meter rates.

How Plan is Worked

In some municipalities the citizen is permitted to purchase his own water meter, which, after being tested for accuracy is then installed by the water works department. Many citizens are not aware of this fact although their neighbor may be protected from high water charges by a water meter. Perhaps this condition prevails in your town and you may be able to purchase water meters through your own waterworks department, or through some agency selling water meters.

It can be well understood that the resident who is served by a single tap may be responsible for a larger percentage of water waste than the resident who can afford a more expensive habitation, as a single tap, being used oftener than each tap on the 10 or 12-tap service, naturally wear out much more quickly, and unless you have a very alert and diligent inspector connected with your waterworks department, this waste may go on for days, perhaps, weeks and months, without detection by your civic authorities.

The resident of the small house must not be blamed for all the leaks, not by any means. Many occupants of larger residences are careless and allow the faucets to leak, but where the service is metered the municipality gets paid for this waste until it is stopped. It quite often occurs that person in larger residence receives a high bill on the meter rates, which, of course, he is really entitled to pay if the water has passed through his pipes. Had the plumber been called in to inspect the service this high

The Automatic Sprinkler

Many citizens prefer, for their convenience, to have an automatic sprinkler for watering their lawns, but the charge on the flat rate often persuades the citizen from purchasing this appliance. The municipality cannot take a chance under the flat rate and must charge accordingly for an automatic sprinkler, not knowing whether the citizen will forget to shut off this appliance, since it is not held by hand. After a water meter is installed the city gets paid for the water no matter if the citizen allows the sprinkler to run for hours at a time, although when a water meter is placed on the service this is not very liable to happen.

Unsatisfactory Meters

While there are many different water meters manufactured, several are considered unsatisfactory by the officials of some of our waterworks departments. An unsatisfactory meter is a nuisance, and is unjust to both the municipality and the citizen. Great care, therefore, should be exercised in the purchase of water meters to see that a satisfactory meter is secured.

Due to the extreme cold of our Canadian winters, several makers of water meters have of recent years found it necessary to perfect their product to guarantee the working parts from destruction by frost. It can readily be understood that once the service pipes are frozen they are liable to crack, and this is also liable to happen to the meter unless duly protected. The most up-to-date manufacturers of water meters, however, have equipped their meters so that in case they are frozen the damage done to the meter is negligible and can be repaired in a very few minutes at a minimum of expense. The meter, however, is not liable to freeze unless the service pipe is also frozen, it being impossible to place the same inside the cellar of the water user.

Directors Urge Greater Co-operation

By Organizing and Working Together Tremendous Results Can be Obtained, Says President Minnes—Series of Meetings Will be Held at Various Points in the District

A NEW plan which promises excellent results is being tried out by the recently-elected Board of Directors of the Ontario Society of Domestic Sanitary and Heating Engineers. In future the board will meet in a different city or town each month, and after the official meeting the directors plan to visit the local organization and discuss with the members such important matters as organization work, business problems, and similar questions. By this plan they will be enabled at minimum expense to get in close touch with a great many local points. The directors will be glad to consider invitations from towns or cities in Ontario and will be only too glad to help the men in the trade in those towns or cities in any way they can.

Opened at Hamilton

The first meeting of the directors was held at Hamilton in the Royal Connaught Hotel and was attended by Thomas J. Minnes of Brantford, president; George E. B. Crinyer of Guelph, vice-president; Frank R. Maxwell of Toronto, past president, and Secretary Garrett Frankland of Toronto. It is likely that the next meeting will be held at Niagara Falls.

After their meeting in Hamilton the directors spent the evening with the members of the local association. There were more than twenty-five of the Hamilton operators present. James H. Cunningham, the Hamilton president, was in the chair, and during the evening special addresses were given by the members of the executive. President Minnes took as his subject the importance of organization and pointed out the very great need that there is for it in the trade to-day.

To Get Results

He emphasized the point that if results are ever to be obtained it will be through co-operation and not through the individual members trying single-handed to accomplish things. It is impossible, no matter how hard an individual works personally, he said, to get the results that are obtainable when a great number of men in the same trade and with a common interest, co-operate. By working together the members of the craft in Ontario can solve the many problems which need solution. By working together they will not only help themselves but everyone else in the business. Get together on a broader basis of understanding and find out that, after all, the other fellow whom very often they have been regarding more or less askance is not such a bad fellow. President Minnes told of the work that has been done in Brantford in the way of organization and of the good results that have followed. There is no reason, he pointed out, why the plumbers all over the Province, all over the Dominion also, cannot work together for the common good just as effectively as those in any one town. It is by pulling together, he said, that results will come, and the more members there are to do the pulling the quicker things will be accomplished. Every man in any trade, he pointed out, has a duty towards that trade, and if he does not perform it he is acting selfishly and directly against his own interests as well as of all the others.

Has Been Prevalent

There has been too much of this keeping to oneself, Mr. Minnes pointed out, and it was responsible for a great deal of the troubles that are to be found in the trade to-day. Such evils as price cutting would be unknown if the proper spirit of co-operation existed as it should. Instead of keeping to themselves and working only for themselves, President Minnes urged those present to get a broader viewpoint and work for the good of the trade, and in doing this they would benefit equally.

Vice-president George E. B. Grinyer of Guelph gave a splendid talk about the importance of having proper business methods and especially of keeping books.

Cannot Make Money

He pointed out that while a man might, by good luck, make money by following a haphazard system or no system at all in his business, it left him continually open to all kinds of troubles. The merchant or business man to-day who did not keep books and carry on his business in a business-like way was certain to lose a lot of money and have endless work and worry. Lack of proper system, he pointed out, inevitably made for confusion, and in the plumbing trade generally there was great need for the inauguration of business methods. Without these, he pointed out, it was impossible to get the results that should be obtained.

Tells of Overhead

Secretary Garrett Frankland dealt at some length with the business side of the plumbing trade, emphasizing the importance of knowing just where one stands. Without a thorough knowledge of the cost of doing business, buying costs, overhead and so on, he pointed out, it is impossible for a plumber or any other man engaged in business to figure intelligently on work, on his expense, or to know whether he is really making money or not. Scores of men in the plumbing trade, he declared, have worked and worked very hard for years, and at the end of fifteen or twenty years discover that they have not made any money. They have not got results that they were entitled to, or their work

WHAT ONE SIGNBOARD CONCEALS

A rear view of a signboard that stands within a hundred yards of the general post office, the municipal centre and one of the largest hotels in a leading Canadian city. It screens a confused pile o inflammable rubbish, mixed with decaying vegetable matter and other waste products. The civic authorities are said to have permitted the existence of this dangerous and disease producing condition more or less continuously for several years. What are the sanitary inspectors doing.—From May issue "Conservation."

and their skill, Mr. Frankland said, because they had no appreciation of the principles of business. One of the greatest faults in the trade to-day, and one that must be remedied, is lack of business knowledge.

Will Be Forced

Conditions generally and the competition that is so keen are forcing men to do business in a businesslike way or to go out of business. A man is entitled to a reasonable profit on all his work, but too many of the plumbers, through lack of business knowledge, have been putting in long hours and doing all kinds of hard work and making little or no money. The trouble was that they were trained entirely as plumbers, and no attention whatever was given to the business side of the question. He pointed out the different position in which the plumbers who have adopted business methods find themselves from the men who have not. The firms who know all about their costs, their expenses, their selling costs, and every detail about shop costs, time, labor, advertising, store upkeep and general overhead have a tremendous advantage over the man who is working without this knowledge. Not only in figuring contracts but in every phase of the business they have the man who is working without proper business methods at a disadvantage. The final result is shown in the fact that when a job is completed they have made a profit and have money in the bank, while the other man has put in all his time and hard work for nothing.

Gave Them Facts

Mr. Frankland gave many facts to substantiate fully the claims he made and showed how plumbing firms which had been making little or no money, by putting their business on a proper basis, had not only made money but built up a steadily growing business. There was no need of men in the plumbing or any other trade working for nothing, he said. People were willing to pay for the work they had done, and it was the plumbers' own fault if, through lack of proper business methods they did not charge enough to cover all overhead and allow for a fair profit.

Secretary Frankland also spoke of the good results to be obtained from co-operation and organization, and urged every member to help in every way possible. If everyone works together, he said, conditions can be completely changed and the whole trade put on a better basis.

District Meetings

In connection with the organization work that is being done the directors, besides holding their regular monthly meetings in various places in the district, are co-operating with Secretary Frankland by attending frequently gatherings at which he speaks. Recently Mr. Frankland paid a visit to the local organization at Guelph. He was accompanied by President Minnes of Brantford and C. D. Henderson, also of Brantford. The meeting was presided over by H. Mahoney and the addresses on organization, business, and co-operation by the visitors were listened to with keen interest.

Another meeting that also aroused much interest was held at Kitchener, when Mr. Frankland addressed the members of the Twin Cities Association, members from both Waterloo and Kitchener being present. H. Haas, the chairman of the local association presided, and during the evening addresses were given by Vice-president George E. B. Grinyer of Guelph, H. Mahoney, also of Guelph, and Secretary Frankland. At this gathering Vice-president Grinyer particularly emphasized the importance of the members out in the towns and cities of Ontario co-operating fully with the Ontario Association.

Many Others Planned

A number of other meetings are planned in various parts of the province, and every effort is being made by the executive to get every member of the trade working with them in their efforts.

Displays and Their Value to Dealer

IN this and recent issues of SANITARY ENGINEER, illustrations have appeared of store interiors and windows, which plumbers in towns, large and small, are using as a means of attracting trade. The method of display being employed reveals how carefully these dealers are studying, not only the goods they are handling, but the trade to whom they are catering. In short, the plumber is getting away from the mere fact that he fixes taps, and extending his activities to merchandising the goods that he is handling.

There is no getting away from the fact that one of the first requisites of satisfactory merchandising is a neat display room. It doesn't need to be so extensive, but the goods displayed should be arranged in such a manner as to attract favorable attention. Too often is it the case, not alone in plumbing stores, but in other lines as well, that the entrance is cluttered up with boxes. Customers can scarcely approach a counter without scraping their shins against some unnecessary projection. The real comfort and enjoyment of the shopper is not catered to as it should be.

There are some who take no enjoyment out of shopping, it may be said, and this is even true, conditions such as above, no doubt, contributing to this attitude. However, the average buyer can see pleasure in shopping where cleanliness and neatness of display are hand in hand. And there is just a point that might be emphasized in the display which the plumbing store adopts—it should be kept clean.

Perhaps few classes of goods lend themselves to such a bright, attractive appearance as those handled by the plumber. The bath, washstand, mirror, or bathroom fittings are naturally cleanly and it is by endeavoring to further the function of these in their relations to the individual that the plumber should adopt his methods of display.

The real value can scarcely be estimated; an impression must be made on the customer by a real neat display, and the extent of how favorable it is depends on the seller. One thing which can be played up more reasonably when the display is a worthy one is the quality of the work which you can do, and that quality talk is a good one to adopt and put into your work as well. It is one way to get away from a cheap class of job, which proves unsatisfactory to the customer and unworthy of the best efforts of the trade.

Another section of the display which can be worked to advantage is that of the window. Many there are to-day who do not change their display as frequently as they might, who allow dust to accumulate, and the windows to become streaked with dirt. This attitude of neglect is one which is keeping these dealers from securing the maximum of results.

A bath tub is not alone a bath tub—it may represent the difference between good health and poor health; the wash basin lends an air of satisfaction in the uses for which it is adopted. Every individual part of the complete bathroom has its function, and in making a good display arrangement and employing convincing sales talks, the dealer will largely increase the business he is now doing.

Sees Huge Export Trade Ahead For British Firms in Markets of the World

"BRITISH manufacturers are fully prepared to more than hold their own in the world markets. They are not asleep; they are reaching out and getting in all parts of the globe markets which the Germans and Austrians have been forced to relinquish."

This was the view expressed by T. A. McIntyre, director of the firm of Shanks & Co., Ltd., Barrhead, Scotland, who is paying a business visit to their Eastern Canadian representatives, W. H. Cunningham & Co., 183 Church Street, Toronto, when talking to SANITARY ENGINEER. Mr. McIntyre, who is manager of the firm's branch in London, England, is on his way around the world and is spending three weeks in Canada before leaving for Australia and New Zealand. From there he goes to China and then on to India.

Sees Huge Business

"There are huge markets now open," he said, "and we hope to get our share of the business. In the short time I have been in Canada I have been able to get in touch with a lot of good business and size up the situation so that we will know exactly what to do. One of the things the British manufacturer has learned is to adapt himself and his goods to the market. Prior to the war many British firms, when entering a market did not endeavor to meet the views of the buyer. For instance, if a buyer wanted an article made light and the British goods were manufactured heavy, the tendency was for the buyer either to take the heavy goods or buy somewhere else. British firms are now adapting their goods to the demands of the purchasers and they will get a lot of business in this way that they would not get otherwise.

"The great thing about most lines of British made goods has been their unquestioned quality," stated Mr. McIntyre. "The high standard that has been set in the past will be fully maintained. The Germans unconsciously paid some remarkable tributes to British made goods in their imitations. They made the most barefaced efforts to capture business by making inferior articles which in appearance were like the British goods, even to forged Government marks. They were absolutely unscrupulous about their methods. Our firm had an instance that one would hardly believe until it was proven. Our agent in Germany found that he could do a big business in our goods. While accepting money from us for looking after our interests he deliberately started in on his own hook to produce a cheap grade article that looked like ours. He used our name and marks and naturally sold a lot before we found out what he was up to. When the case was put up to him he not only admitted it but was rather proud of what he had been doing. It is difficult for the British manufacturer to understand tactics of this kind, but since the war we have learned a lot about what the Huns were capable of doing.

Tremendous Possibilities

Mr. McIntyre sees tremendous possibilities for export business in China and South America. There will, he says, be business all over the world, but China and South America he regards as two of the very richest fields. He looks for British firms to develop an enormous business.

"We are preparing to take care of a huge business," he said. "Since the war many British firms have extended their plants greatly and are capable of much larger production than formerly. In spite of the fact that we are facing reconstruction problems, everyone is looking forward with the greatest optimism to the future. Our own case is typical of what is happening. For nearly forty years we have been steadily adding to our plant and selling all that we can produce. We now have 1,100 men, and at our annual meeting the question came up of what we were to do in regard to reconstruction. Everyone was unanimous that we must be prepared for larger business. It was decided to start work at once on a big new plant that will treble our capacity. The work is now under way. We are after business all over the world and I think there is no doubt at all that we will get our share."

Sometimes Misjudged

Sometimes in the past British firms have been misjudged, and in some quarters people got the idea they were slow because they did not go after certain markets. One thing was lost sight of entirely and that was that the Britishers often had a choice of several markets open to them and invariably chose the ones in which the most money was to be made. Many British firms for years have been in the happy position of being able to sell more than they could produce. Now they have increased their production capacity, and with the world's markets open, are going after the larger fields."

Mr. McIntyre referred to another phase of the question which is going to be a big factor in helping the British manufacturer to get results and that is the new spirit brought about by the war. "There never was closer co-operation between capital and labor than now," he said. "Some trouble occurred at first and it was caused largely by such elements as the Socialists and Bolsheviks. The average British workman is too level-headed to stand much of that kind of thing. For a time in Glasgow we had about as rough a time as anybody could want, but the arrival of the men who had been at the front soon ended the trouble. The soldiers were doubly angered also with the trouble makers, whom they regarded as men who had stayed at home when they should have been at the front. The soldiers were doubly angered because by the trouble these men were making they were keeping them from being demobilized and getting home. They were just aching to get a chance at the trouble makers, and when the Bolshevists and others saw what was coming the bottom soon dropped out of the strike.

Co-operating Closely

There is a new spirit between capital and labor, and it should work wonders. The men in the past undoubtedly had grievances. Many employers regarded them as chattels and disregarded their rights. Since the war they have learned differently. The men on their side have learned something of the difficulties that capital has to contend with. Now, under the Whitley councils, any questions that come up are speedily and satisfactorily adjusted. I think capital and labor in England are working more closely together now than ever before and will continue to work together."

Mr. McIntyre expects there will be some splendid openings in England for Canadian products and looks for a steadily growing trade between the Dominion and the Motherland. He also looks for a large emigration to Canada.

"From what I hear among our own men," he said, "we are likely to lose many of the younger men. They are talking a great deal about coming to Canada. This idea is general. One sees in the papers every day advertisements from men who formerly held indoor positions wanting outdoor work. They will never go back to the old work again. One hears a great deal about Canada everywhere and it will undoubtedly attract a large number of those who want to get away from the old conditions."

Says Small Town Plumbers Are Passing Up Fine Opportunity for a Lot of Good Business

Every Farm Home Without Modern Conveniences Offers a Real Prospect That is Easy to Land, Declares Manufacturer —Says Methods of Sewing Machine Men and Piano Salesmen Should be Copied

THAT there is a tremendous field for business for the plumber in the small town who goes after the trade in the farm homes was the view expressed to SANITARY ENGINEER by a leading manufacturer. The whole matter in his opinion centres around the plumber going out after business aggressively and in using good salesmanship. The salesmanship end of the business will come with a little experience, he declared.

"What every plumber who wants more work should do," he declared, "is to familiarize himself with every home in his territory. He should know what homes have no bathroom, what homes need a water system, what homes have no conveniences, and in what homes new equipment is needed. It is not hard to get these facts."

Get in Touch

A call at any of the homes is easily made if the plumber is not already in possession of the information. Most plumbers could name off a long list of people right off the reel who are prospects. They know that John Smith ought to have a bathroom in his home, that he is quite able to afford it and so on, but they never go after him and show him just what he is missing by not having one, or how little it would cost him. There are scores of such prospects in every community, and if they were gotten after by a live plumber who was able to give them all the information they would buy. The trouble is that too many plumbers wait for the farmer to come in and ask about the work he has in mind. All over the country there are prosperous farmers who would buy if they were approached and shown this or that line of goods, and given prices and details. The plumber, if only he realized it, has the best chance of all in talking to the farmer and his wife right in their own house. They are at home there and are not fussed up or nervous as they very often are if they come into a store to ask about something they want.

Needs Salesmanship

A little salesmanship is all that is needed to get them interested and close a deal. The plumbers, in my opinion, might with advantage take a leaf out of the book of the sewing machine agents or the piano salesmen. These chaps don't wait for the people in the country to come into their stores and ask them about the goods. They would not sell a quarter of the machines and pianos that they do if they waited for business to come to them. They make it their business to find out what homes need a piano or a sewing machine and then they go right out and see the prospect. It is no trouble in a very large percentage of the visits made to close a deal. It is no harder, in fact not so hard to sell a nice bathroom outfit or some other line that is going to make the home really better and give years and years of comfort and service, as to sell a piano, which after all is more or less of a luxury. The plumber has ten real sales talking points right at his fingers ends to one that the piano salesman has, but because he does not try he does not get the business.

Many sewing machine agents take a machine right along with them to let the farmer's wife see how it will work. The plumber does not need to take a bath tub or a pump with him. He can take a splendidly printed catalogue supplied by the manufacturer and can show the prospective buyer a dozen different sizes and styles. In a home where there is no bath tub, or conveniences, or where they have to depend for water supplies on a well, the plumber has got a whole string of real arguments right at hand. The farmer who is without these things knows absolutely that he ought to have them because they will make his home better and save him time and work and trouble. All he needs is a little aggressive sales talk to sell him, but it is surprising how few plumbers will go after business in this way, and they are losing one of the finest opportunities they ever had to make a lot of easy money."

A TIMELY TIP
TO THE
FARMER'S WIFE

—Make life worth living— investigate the merits of

THE NEW HYDRO PNEUMATIC WATER SYSTEM

Operated by hand or electricity.

Water in your own home without an effort for bath, cooking and drinking purposes, upstairs and downstairs, and utilizing your present sewerage disposal system. Come in or phone and have our representative call on you and explain its merits, price, etc.

Gasoline engines, pumps, water closets, baths, lavatories, sinks, laundry trays, pipe and fittings, overhead irrigation systems, rural electric lighting systems.

Tinsmithing and Sheet Metal Work Neatly and Cheaply Executed.

EDWARD MACKNESS

IMPERIAL BLDG., Sarnia
Phones: day 638, night 605

There is no one better able than the farmer to make improvements. This is indeed a "Timely Tip." Are you catering to the farmers' trade too?

TO CONTINUE STUDIES ON METAL PROBLEMS

That the Montreal Metallurgical Association, founded in 1915 in order to secure a greater degree of efficiency in the methods of the munitions plants, will continue its activities on a permanent basis was the decision of members of the council of that body who met at the Macdonald chemistry building at McGill University.

Dr. A. Stansfield, the founder of the association, has retired from the presidency, and G. Percy Cole has been elected to that office. The association now has a membership of 245. The program for the coming year will include the reading of papers by experts on iron, steel, brass, foundry work and commercial problems of the iron and steel industry. During the summer excursions to metallurgical plants in Montreal and the surrounding districts have been planned.

Officers elected were: President, G. P. Cole; vice-president, H. J. Roast; secretary, Capt. J. G. Ross; members of council elected for first time, W. K. Gillespie, J. D. Paxton, E. M. Seale; members of council re-elected G. P. Cole, G. R. Kendall, H. J. Roast, Prof. J. Haynes, E. C. Kirkpatrick, W. G. Dauncey, F. G. Gardner, B. A. McFarlane, and T. R. Davidson.

BRITISH CONCRETE BRICK INVENTION

LONDON, ENG.—It is reported that a super-concrete brick has been invented which is thoroughly damp proof. The brick is described as being hard as blue bath stone, and very difficult to cut after it has been in the walls for a few weeks. Its cost is about a third of that of the ordinary brick, and it can be marketed at ten dollars per thousand. A machine has been designed for which it is claimed that it will turn out nine-inch concrete bricks at the rate of from eight thousand to ten thousand per day. They can be used in constructional work the day after they have been made.

What Others in the Trade Are Doing

There Are Many Suggestions Here That You May Adapt Not Only in Arranging Your Own Advertising, But in Keeping Seasonable Lines Before People—Many Firms Using Illustrations in Their Ads

"Wiring Time" is the heading of an ad. which occupies two columns of space, nine inches deep, of A. E. Wrigglesworth, sanitary and heating engineer and electrical dealer, Shelburne, Ont. Below the heading the ad. reads: "Special attention to house wiring for electric lights. I have on hand a large stock of wiring material, fittings, etc., and with a practical experience of twenty-four years, wiring being a part of it for the past fifteen years. Those entrusting me with work are assured of especially good service."

The Hunt Plumbing Co., London, Ont., heads its advertisement, "A Modern Bathroom," in display type. This heading is followed by "A modern bathroom is considered one of the best rooms in a home. Let us quote you prices." The Hunt Co. nearly always uses an illustration with its ads., and accompanying the one described above is a cut showing the workmen installing a handsome tub in a tiled bathroom.

C. H. Marshall, Caledonia, Ont., advertises a special line of pumps for wells and cisterns; also force pumps, brass or iron cylinders, and a complete stock of all repairs. "Estimates are freely given on all plumbing, heating, gas piping and eavestroughing work," the ad. says. He also features some specials in tinware and graniteware.

Livingston & Moodie, Barrie, Ont., plumbers and electricians, advertise as follows: "We are the sole agents for the famous —— electric vacuum cleaner. Now is house-cleaning time and everybody wants carpets, rugs, walls, curtains, etc., cleaned. Anywhere dust collects we can get it, even to the picture molding, pictures, shelves, etc. We will ren our machines by the day at $1.25, or we will go and work it ourselves for $1 an hour.

Mainer & Bartindale, Orillia, Ont., advertise "Plumbing" in large type, below is an illustration of a housewife showing a plumber about some repair work, and the ad. reads on. "For a first class sanitary job, with absolutely quality material, call us. Electric work of all kinds, motors repaired, house wiring, all new materials. Furnaces for a warm house with our guarantee, at the best price. Come to us."

Weldon Carter, Summerland, B.C., says in his advertisement, "Weldon Carter, plumber and heating engineer (in display type) with a larger stock of supplies and material and more help, I am now in a much better position than ever before to attend to your orders for plumbing and heating.

A. E. Law, Leamington, Ont., in an ad. eleven inches deep and two columns wide, has his name in large type and then says, "For plumbing, heating and electric wiring" (in display). Then follows, "All kinds of electric appliances. Agent for —— electric power and light plants."

H. G Solomon, Grand Valley, Ont., in his announcement, two columns wide and two inches deep, says: "Classy plumbing and heating. We are now ready to do all kinds of plumbing, furnace work, eavestroughing and general repairing."

Sanderson and Robertson, Orangeville, Ont., head their advertisement, "Electric Wiring," in large type, and then say: "If you are thinking of having your house rewired this summer, you should let us figure on the job right away. Indications are that there will be a great deal of work wanted this year, and it is only prudent to place your order early. What about that bath you were thinking of putting in as soon as the war was over? This work is right in our line, and we rather pride ourselves on the tasty, well-finished jobs our experience enables us to give our patrons. If you are going to instal a new furnace, we advise you to get estimates right away. There is nothing to be gained by leaving this work until fall and then having it done in a rush. Plumbing, steam fitting, tinsmithing."

Dennis Howe, Ingersoll, Ont., heads his announcement with "Rip out that old tub," and then advances arguments why every home should have "a fine up-to-date bathroom."

J. C. Stewart, Weyburn, Sask., under the heading, "For your new home," emphasizes his ability to instal hot water or steam heating, and also to look after all plumbing work. "Prompt service, moderate prices and satisfaction are guaranteed," concludes the announcement.

H. H. Rouse, of St. John, N.B., features "Plumbing, heating and metal work" in the heading of his advertisement. Another feature that is emphasized is a motor service to facilitate all work, especially that in the suburbs.

D. N. Flander, Ingersoll, Ont., is making a seasonable appeal based on a line of gas ranges at $22 and up. Stoves are featured all through the advertisement, and Mr. Flander announces that he is willing to accept Victory Bonds in payment of purchases.

J. J. Nealands, Barrie, Ont., features —— stoves and ranges and below this heading says "Call and get our prices before buying your new range. We do all kinds of plumbing, heating and tinsmithing work. Sole agents for ———— furnaces. Repair work promptly attended to.

Andrew Sheret, Victoria, B.C., under the caption in display type "Plumbing and Heating," says "High grade bath tubs cost the same with us as the standard grade. We only stock the best, but our prices are equal to the price of cheap grade goods you will find on the market to-day. All we ask of you is to examine the articles in our store before deciding on your purchase."

Noble & Rich, London, Ont., using a space five inches deep and two columns wide in an Ingersoll, Ont. paper illustrate a handsome bath tub with shower and curtain. Under the caption "A Nice Bathroom" they say "A nice bathroom and equipment is a good feature of any house. It enhances the value and makes life a pleasure for its occupants. The cut shows you a shower bath suspended over the tub. This shower is a beautiful piece of plumbing. To take a shower when you rise in the morning will send you down stairs three steps at a time ready for the chores, breakfast and work. Write us to-day for particulars. We are always pleased to let you have prices and information."

Cutting Down the Overhead

Strathroy Merchant Solves Problem of Keeping Himself and His Equipment Busy All Year Round—Merchandises Bicycles and Auto Accessories and Makes Repairs—Finds These Lines Profitable

Based on an interview by C. E. Parsons, of Sanitary Engineer, with Howard Statham, of Strathroy, Ont.

HOW to keep himself and his shop equipment busy or twelve months in the year was the problem that Howard Statham of Strathroy, Ont., had to figure out.

"There is not enough plumbing work in the town to keep me going for twelve months in the year," said Mr. Statham to SANITARY ENGINEER. "I found out, however, that my shop and store rent, and my general overhead went on just the same though whether I was busy or whether I wasn't. It was up to me to do something, so as I have always been pretty handy at repair work I started in to repair bicycles and pumps and baby carriages, in fact almost everything in the way of equipment. It wasn't very long before I had all I could look after. A lot of people who brought bicycles to be repaired wanted new ones, and a lot of other people who didn't have bicycles often came in to see if I could sell them either a new or second-hand machine or tell them where they could get one. I saw a chance for getting into this business and as it carries a good margin of profit I certainly have not been sorry I made the venture."

Success From Start

"It has been a success right from the start. I would buy fifty second-hand bicycles right now if you can tell me where to pick them up, and I will sell every one of them during this season, probably many more. My sales of brand new bicycles during the past year were 25 and I expect to handle more this season. I find that bicycles are a seasonable line. During April, May and June I clear all bath tubs and other plumbing goods displays out of the front part of the shop and fill it with new bicycles. I find it pays to carry enough stock to show people a variety. It is not necessary though to carry a big stock as I can get a new wheel of any model from the factory in a few hours and customers are always willing to wait for a day. I do both a cash and credit business. If I know the party is allright and that I am sure of getting my money I do not mind letting him have a bicycle by paying so much down and so much a week or a month. It is often easier, especially for a boy who is working, to buy a machine in this way."

Other Business Too

"I find that the bicycle and repair business is starting me into other lines. For intsance there is a good sale not only for bicycle accessories but for auto accessories. I find this business steadily growing and as it is easy to handle and shows a good profit it is just like so much found money in connection with my plumbing store. I would have to keep the shop going anyway, and by stocking the accessories I not only have the goods required to make quick repairs but those which people call for very often."

Mr. Statham not only has a store display of bicycles and plumbing goods but also keeps them before the public by means of his two windows. The windows are not particularly adapted for making a good display but Mr. Statham does the best he can with them.

Knows All About Them

Through handling bicycles and making repairs Mr. Statham has learned thoroughly all about them.

"I find this a tremendous help not only in making sales," he said, "but in making exchanges for an old machine for a new one. I can quickly size up an old wheel and tell the prospective buyer just how much it is worth to me and why. I can also tell him all about the improvements that are on the new wheel and explain how they work and their full value and so on. This is a big help. I like the work and the business also. The experience has been of real value to me as it has solved the problem for me of how to keep busy all the year round and has taught me a lot about business that I can apply in the plumbing trade."

Does Not Interfere

Mr. Statham does not find that his bicycle and accessory business interferes with his plumbing trade. On the contrary it has helped it. It has brought him into contact with many persons with whom he would not have come in contact ordinarily. They come in for auto accessories, or bicycle accessories, or for repairs, and when they have any plumbing work to do they do not forget him.

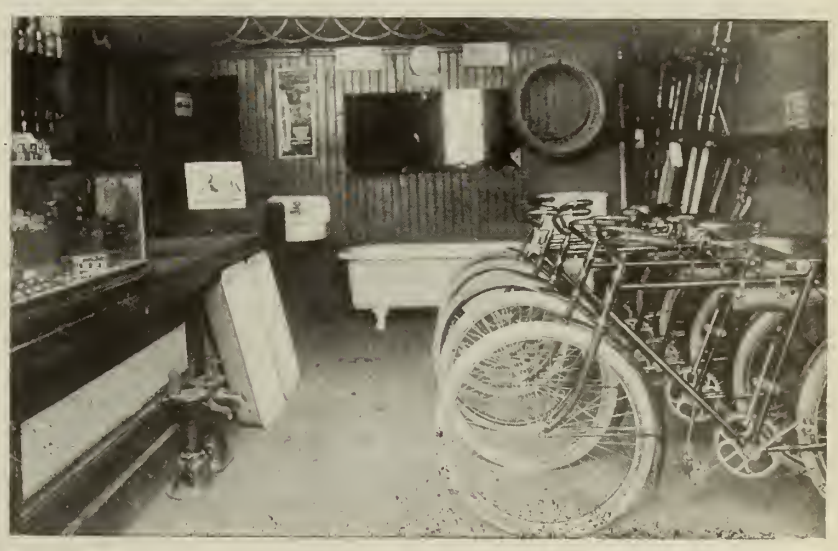
Satisfactory work, whether in bicycle repairs or in plumbing, is insisted upon by Mr. Statham. He wants his customers to be thoroughly satisfied. That means, he says, that they will always come back and also that they will tell their friends.

Whenever he is called upon to do any plumbing repairs Mr. Statham looks carefully over the work and if, as is usually the case, he finds it better to put in a new part than to repair the old he advises the owner.

Advice Appreciated

"People appreciate this," he said. "A man who pays several dollars for a repair job and then has to have it done all over again in a few weeks or a month is not likely to be in a good humor over it. It would have been better for him to pay only a little more and get a new part. Then he will get satisfaction perhaps for years and appreciates the advice of the plumber and will come to him again when he has other work."

(Continued on page 25.)



Many plumbers in the smaller towns sometimes complain that they are unable to create enough business to keep them engaged all the time. Howard Statham of Strathroy, Ont., had the same problem to face and he has undertaken the merchandising of bicycles and automobile accessories. He has found these lines a splendid business addition and the above view of his display room gives some idea of the space he is devoting to this line. His own views on the subject are expressed in the accompanying article.

EDITORIAL COMMENT

WHAT IS BELOW SURFACE?

ARE the demands being put forth by labor to-day engineered by those who realize that their interests are linked up with the industrial welfare of the country as a whole or is it just a concerted move on the part of extremists to fight constituted authority? The better elements of labor are expressing themselves as satisfied with conditions generally prevailing and capital is very largely endeavoring to inaugurate reforms which will eliminate the evils prevalent not so many years ago.

Where then is all the present unrest originating? Who is responsible for the general strikes in Western cities which threaten to extend to Eastern points as well? Is the move for forty-four hour week and increased pay just a blind to cover up some more insidious move? How is the employer to be assured that in granting these shorter hours and increased pay he can go ahead and make his plans accordingly?

In Winnipeg, union after union have utterly disregarded their agreements, have thrown them aside as mere "scraps of paper." The question is then, how to guarantee against a recurrence of such an attitude in respect to any new agreements. Surely the man employing labor, who has the pay roll to meet, should be given some consideration. It is not our contention that all employers of labor are ideal bosses, that they have the interest of their employees at heart, but then again the extremists in labor are no better in the radical views they hold.

It is generally admitted that trade unionism has done much to improve the conditions under which labor has been employed and manufacturers as a whole recognize the principles of the unions. It is by co-operation between capital and labor that most idealistic relations for all concerned can be secured. There is admittedly a red flag element in labor no less than a Prussian element in capital. The two should be suppressed and the better elements get together to work out a solution which will prove fair to all concerned.

CHEAPENING THE HOUSING SCHEME

WHILE it has been a long time developing, the plan of the Ontario Housing Commission to relieve the shortage of dwellings is beginning to materialize. Tenders are now being called in several places for dwellings in considerable numbers. Other tenders will be called very shortly and indications are that before the summer is very far advanced there will be a lot of building under way. As pointed out in former issues of SANITARY ENGINEER there is a splendid opportunity here for the plumbing dealers not only to round up a lot of good business but to render real service to their community in making suggestions that will prevent the erection of homes that will not be satisfactory. In some places there has been a tendency to cut things rather too fine. For instance, in one municipality the type of bath tub that has been selected has caused criticism in some quarters for the reason that no matter how attractive the bathroom may be made by design and finishing the bath tub will always look cheap because it is cheap. For a very little more, it is stated, by those who object to the tub specified, a tub that would have been much more attractive is obtainable. There is perhaps a lot in this argument and its full force will become apparent after the house has been in use for some time and the house begins to need repairs or the owner begins to compare the equipment in his dwelling with that in some other. Economy of this kind is often very dear in the long run. The same applies to cheap plumbing goods, hardware, cheap paints, in fact cheap anything. Eventually, they make for dissatisfaction because they not only look badly but do not give the service expected. Now is the time, while the plans are being talked over or prepared, to make suggestions that will save trouble and dissatisfaction later.

UNPARALLELED ELECTRIC OUTLOOK

REQUESTS for new power lines and extensions to existing power lines are pouring in to the power companies in numbers that show unmistakably the hold electricity has upon the public. It has gained this hold because of the real service, convenience and economy it has proven. Imagine what the average city home would be without electric lights, an electric washer, an electric sweeper or a dozen more utilities people have come to regard as part of their everyday comfort. And yet only a few years ago these devices were unknown. Because the farm-

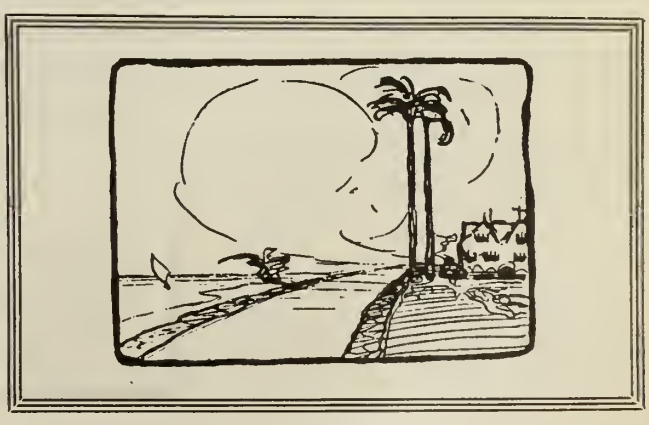
ers have learned from the city dwellers what electricity means they are clamoring for power lines, and they are getting them. Many millions of dollars are to be spent in the next few months in extending power lines into the rural districts. More millions are to be expended in providing for the additional power requirements of the cities. It is an ever growing business and it opens to the hardware dealer a field that is at once profitable and easily handled. Very few of the goods in his store will lend themselves more readily to display than the electric lines. Many of them practically sell themselves. Dealer after dealer will tell with real enthusiasm what good results have followed the taking on of electrical goods. When it is remembered that electrical development, vast as it has been, is still only in its infancy and that Canada is a land whose waterfalls contain boundless stores of electric energy, much of which is as yet untouched, some idea may be gained of what the electrical business of the future is going to be.

ONE OF THE BIGGEST BUYERS

THERE is every indication that from a purchasing standpoint the farmers of Canada this year will break all records. With the markets that have been open to them for some time and the prices that have prevailed and are still effective the agriculturists are now to be reckoned in the very best class of buyers in the Dominion. They were always one of the largest buyers, but now they are one of the best. They have the money and they want the goods. Dealer after dealer has commented to SANITARY ENGINEER upon the insistence shown by the farmers in demanding the best there is, regardless of price. There are some big opportunities open to the plumbing men as a result of this situation and many of them are making the most of their chances to sell big bills of goods to the farmers. Anything that will make the home better or more comfortable, or that will make his work easier or more quickly performed is of special interest to the man on the farm. In your class of business are many lines carried that meet these demands as readily as can be found in any business. No class of merchants come into more direct personal contact with the farmer than plumbing dealers. The question of getting the big business that is offering centres around the ability of the merchant to lay in a stock that is going to be needed by his trade and then of letting the trade know that he has it. Merchants should always bear in mind that the auto has in a great many sections of the country eliminated distance and that if a farmer finds he cannot get what he would like at the town store he will think nothing of motoring fifty or more miles to some other store where he can get such a selection of goods as he desires. On trips of this kind he usually takes his wife and family along also, and they have needs also that offer prospects for much good trade. Trips of this kind are unnecessary if the farmer and his family know that the home dealer has the goods and that he is prepared to give them service.

MAKING GOOD PROGRESS

IT is gratifying to learn from those in close touch with the matter that splendid progress is being made in Toronto by the "Ender" clubs, in regard to inculcating into the members the vital importance of business training. Special efforts have been centred on this branch of the work in the past two months and the results, it is stated, are more than encouraging. Talks by men thoroughly conversant with the details of business management, overhead and other questions are given at the regular meetings. These talks are aimed not to be loaded down with a lot of technical detail and high-sounding terms but are made as simple as possible, and an informal discussion always follows at which anyone may ask any questions desired. As a result of what they are learning many of the Toronto plumbers are making radical and important changes in their business methods. They are beginning to see that certain principles followed out will produce certain results, one of the principal being a fair profit on all work engaged in. This idea of promulgating business instruction among the trade is also being carried out by the Ontario Association. Reports regarding the way business is being carried on in many parts of the country indicate that there is a general need for more work of this sort. There is every indication that it is going to develop into a movement that will go a long way toward putting the entire trade in the position it is entitled to. It is just as easy to carry on a business by proper methods as to "run" it by any old plan, and when results are summed up in the shape of profits and growing trade there is no comparison in the results derived between the two plans. Education along business lines is one of the great needs of the trade to-day and it appears that a new era in this important matter is dawning.



How to Figure by Divisional Method

Practical Business Discussion at Meetings of the "Ender" Clubs in Toronto Show Many Members of the Trade Where They Have Been Making Wrong Estimates and Losing Money on Work

Written for Sanitary Engineer by C. E. PARSONS

THE Toronto branch of the Ontario Society of Domestic Sanitary and Heating Engineers has adopted the open price system of tendering. While it is too early yet to be able to make definite statements regarding results, there is no question at all that everything has been most satisfactory so far. Through the "Ender" Clubs and through special meetings every effort has been made to give the members all possible details regarding the working of the open price system and the divisional method of figuring profits on overhead and selling price.

The new idea that is being encouraged in the trade of Toronto, that is, of adopting business methods in regard to carrying on business, is being enthusiastically received. One of the best indications perhaps of just how strongly this has taken hold, may be gathered from the record attendance at the meetings of the "Enter" Clubs.

Coming Out Well

There has been such large attendance at these weekly meetings, and the numbers have been growing so steadily with each successive meeting that now the question has to be considered of securing larger quarters in which to hold the sessions. The interest that is being taken in the work is not alone manifested by the large attendance, but by the questions asked, which show as nothing else can, that those who hear the talks on business recognize many problems in their own shops which need adjusting, and that they are out to get the knowledge that will help them to do more business in a more efficient manner and make a fair profit on the work they do. Secretary Garrett Frankland, of the Ontario Association, is enthusiastic over the prospects and the way in which the members of the various organizations have taken hold.

Now is the Time

"Now is the time to make the change," he told the members of the North "Ender" Club at their meeting on Thursday evening last. "We are at the parting of the ways, not only for Toronto, but for the whole Dominion. Either we are going to go ahead and make some real progress by adopting the methods that have made for success in other lines of business, or we are going to go back. There is every indication that we are going to go ahead. All over the province I find an interest being taken in the movement to make things better that spells for success. By adopting business-like methods and by working together we can accomplish big results. There is nothing like co-operation, and the boys are beginning to understand the spirit of the thing and see the possibilities ahead."

How It Works Out

At this meeting as well as at other meetings of the "Ender" clubs held during the month, a practical address on "How to Figure by the Divisional Method" was given by Mr. Percy Mansell, of Toronto. By means of a blackboard he figured out for the members present actual problems with which they have been coming in contact every day. He explained fully the system of figuring and compared it with the old methods, showing why many of those in the trade have not been making the money they thought they were making because they were figuring by wrong methods.

To Find Selling Price

The table, which is reproduced, is the basis on which the whole system is worked. Mr. Mansell took the various problems presented to him by the members and worked them out, showing exactly what the selling price should be. He then proved them by working them backwards. He stated that too many men in the trade in figuring fail to in-

Table for Finding the Selling Price of any Article

COST TO DO BUSINESS	NET PER CENT PROFIT DESIRED																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	20	25	30	35	40	50
15%	84	83	82	81	80	79	78	77	76	75	74	73	72	71	70	65	60	55	50	45	35
16%	83	82	81	80	79	78	77	76	75	74	73	72	71	70	69	64	59	54	49	44	34
17%	82	81	80	79	78	77	76	75	74	73	72	71	70	69	68	63	58	53	48	43	33
18%	81	80	79	78	77	76	75	74	73	72	71	70	69	68	67	62	57	52	47	42	32
19%	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	61	56	51	46	41	31
20%	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	69	55	50	45	40	30
21%	78	77	76	75	74	73	72	71	70	69	68	67	66	65	64	59	54	49	44	39	29
22%	77	76	75	74	73	72	71	70	69	68	67	66	65	64	63	58	53	48	43	38	28
23%	76	75	74	73	72	71	70	69	68	67	66	65	64	63	62	57	52	47	42	37	27
24%	75	74	73	72	71	70	69	68	67	66	65	64	63	62	61	56	51	46	41	36	26
25%	74	73	72	71	70	69	68	67	66	65	64	63	62	61	60	55	50	45	40	35	25

RULE

Divide the cost (invoice price with freight added) by the figure in the column of "net rate per cent profit desired" on the line with per cent it cost you to do business.

Example

If a bath tub cost - -	$20.00
Freight and cartage - -	1.50
	$21.50
You desire to make a net profit of	25%
It costs you to do business -	15%

Take the figures in column 25 on line with 15 which is 60

60 | 21.50 | $35.83 = Selling price

180
350
300
500
480
200
180

The percentage of cost of doing business and profits are figured on selling price.

Example

If an estimate on a contract totals - $300.00 actual cost
You desire to make a net profit of 10%
It costs you to do business - 15%

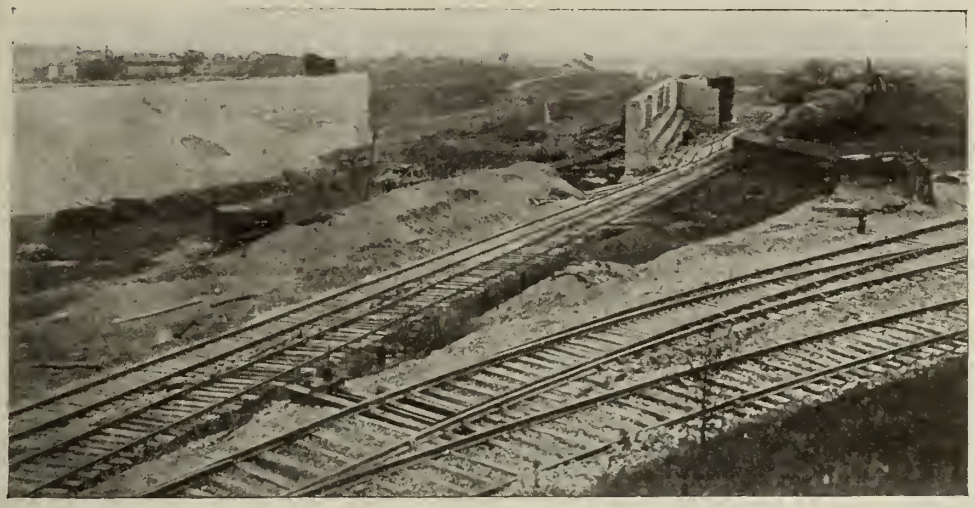
Take the figures in the column 10 on line with 15 which is 75

75 | 300.00 | $400.00 Amount of your proposal.

300
00

The percentage of cost of doing business and profits are figured on selling price.

Current Events in Photograph



NEW WELLAND CANAL

This shows the latest stage of the huge undertaking and also gives an idea of the magnitude of the work yet to be done. The view is taken looking from the head of the lock toward Lake Ontario. There is a stretch of the canal bed about 170 feet in width to be cut out of the solid rock.

clude enough for overhead, forgetting apparently many of the things that overhead includes, such as tools, equipment, compensation, their own salary, light, heat, and all expenses. As a result, they come out short. Taking 15 per cent. as a reasonable basis to allow for overhead, he based all his problems on that.

The following represents a typical problem and shows fully how the selling price and profit is arrived at:

First, find the cost of material and to it add your labor. You thus have at a glance the two important items. Add them together and secure the estimated total cost.

Material cost is	$225.00
Labor cost is	75.00
Estimated total cost L. & M. is	$300.00

This fills the first three lines of the open price sheet.

You now divide this sum by 75, thereby arriving at a selling price of $400.00.

The overhead allowance is 15 per cent. of your selling price, or in this case $60.00. This is entered on the fourth line. Your net cost, therefore, is $300.00 plus $60.00, or $360.00, which amount is entered on the fifth line.

Your desired profit is 10 per cent. of the selling price, or $40.00; this is placed on the sixth line and added to your net cost, thus giving the selling price of $400.00, or the amount arrived at by the 75 divisional method.

In cases where the cost is not in round figures, the selling price will be similar, or as an example: The cost of labor and material is $427.85. By the 75 divisional method, the selling price will be $427.85, divided by 75, equalling $574.66.

As a tender is usually submitted in round figures, the tender therefore will be either $574.00, or $575.00. This is the reason for the two bottom lines on the open price sheet.

The question came up as to whether 15 per cent. is enough to allow for overhead. This is a matter for the individual to decide, as sometimes conditions vary, but in ordinary cases it was thought that this was a fair figure. In Detroit, it is stated, a higher percentage is taken as a basis. Mr. Mansell figured on a job in three ways, by using the old method, by using the divisional method, and by taking the higher overhead figure adopted in Detroit. Taking $135 as the estimated cost of labor and material, he showed that under the old plan of figuring the plumber would get $148.50, by the divisional method of figuring the price would come to $180, and by using the higher figure for overhead adopted in Detroit the work would figure out to $225.

Don't Put It Too Low

Another point that came out in the discussion was that plumbers in figuring their own time should not base it at the rate of pay received by journeymen. The master plumber's time is much more valuable and should be figured at at least double that of the journeyman. Taking a time and material job involving material valued at $242 and twelve days' labor, Mr. Mansell figured that the net cost would be $358.12, allowing 15 per cent. for overhead and $62.40 as the figure for 12 days' labor. In case a higher figure than 15 per cent. is required for overhead allowance, the net cost is arrived at by dividing the total cost of labor and material by the difference between 100 and the desired figure for overhead. For instance, in the case he figured Mr. Mansell divided by 85 the difference between 100 and 85. Had he wanted to allow 20 per cent. for overhead, the divisor would have been 80 or 100 less 20.

Favor 16 Hours

The "Ender" clubs are taking an average cost on a six piece job, with a view of recommending to the Conference Board a standard time for doing this work. An estimate was obtained from each member and the average struck, and 16 hours was shown to be about the time per fixture. This will be sent to the Conference Board.

Some of the members predicted that the time is coming rapidly when plumbers will charge for their estimate instead of losing a lot of valuable time as they do now in figuring on jobs which they never get.

CUTTING DOWN THE OVERHEAD

(Continued from page 21.)

Mr. Statham is a thorough believer in not only getting in a stock sufficient to meet the requirements of his trade but in letting the people know that he has these goods. The best way of doing this, he says, is through the local newspapers, and he uses a space three columns wide and two inches deep to tell the people about whatever he is offering. His ads are changed regularly. Just now they feature bicycles, as that is the seasonable line he is pushing. He nearly always uses an attractive illustration of a bicycle while these goods are being featured. This is changed during the plumbing seasons to something appropriate for the house in connection with plumbing goods.

Brown and Hornsey were awarded the contract for the plumbing, heating and wiring at the new isolation hospital in Galt, Ont.

News from Here and There

CONTRIBUTIONS OF NEWS GLADLY ACCEPTED

BUSINESS CHANGES

Campbellford, Ont.—The hardware and plumbing business, formerly conducted under the style of Morton & Owen, is now conducted by E. T. Morton.

TRADE NOTES

Metal Studios, Ltd., of Hamilton, Ont., manufacturers of lighting fixtures, have secured new premises at 21 Walnut St. North.

By a unanimous vote the plumbers and steamfitters who are members of the union at Saskatoon, Sask., passed a resolution against the One Big Union idea. They also turned down a proposal of a six-hour day and a strike to enforce it.

J. R. Blais, business agent of the United Association of Plumbers and Steamfitters, Local 144, has sent out a request to plumbers to not to go to Halifax. This has been prompted by the conditions there bringing on a strike. "Our plumbers should not interfere in this affair," said Mr. Blais.

E. S. Stephenson & Co., Ltd., have been incorporated under provincial charter to carry on business as electricians, machinists, founders, etc., with capital stock of $18,000 and head office in St. John. They have taken over the business formerly carried on by Edward S. Stephenson. The directors are E. S. Stephenson, Herbert A. Stephenson and Ralph S. Stephenson.

James Ballantyne, Nazareth Street, Montreal, have been the successful tenderers for plumbing and heating in the new Eaton building at Moncton, N.B., and which will cost, it is understood, about $600,000. Mr. Ballantyne is to be congratulated on securing this big work.

Conroy Bros., Montreal, are awarded the contract for the heating and plumbing in the premises of the Bleury Investment Co., Montreal.

M. Walsh and Co., Montreal, are awarded the contract for heating and plumbing in the Hays Building, Busy Lane.

INCORPORATIONS

Smith & Stone, Limited, capital $100,000, head office Toronto, plan to manufacture and deal in rubber, glass, metal, porcelain and electrical goods.

London Shipping Containers, Limited, capital $50,000, head office London, Ont., plans to manufacture and deal in metal, cardboard, wooden and paper containers.

Hamilton Lamp Company, head office, Hamilton, Ont., capital, $300,000, plans to manufacture and deal in electric lamps and fixtures of all kinds.

TENDERS

The town of Trenton will receive tenders up to June 10, for the erection of a four-room addition to a public school. Plans and specifications can be seen at the architect's office, S. B. Coon & Son, Excelsior Life Building, Toronto St., Toronto.

St. Catharines Public School Board ask for tenders for the erection and completion of two one-story school buildings. Plans and specifications can be seen at the office of the McLean Daily Reports, Ltd., Toronto, and at the office of A. E. Nicholson, architect, St. Catharines.

Tenders will be called shortly for the erection of a new medical school for the Western University, at London, Ont., to cost $25,000. Watt & Blackwell, Bank of Toronto, London, Ont., are the architects.

Sarnia Ont., ratepayers will take a vote shortly on the question of providing $350,000 for a new combination technical and high school.

A syndicate is being organized at Leamington, Ont., to arrange with W. McEachren & Sons, Royal Bank, Toronto, for the erection of a number of new dwellings.

The Hillcrest Housing Co., London, Ont., has commenced work on several new residences, and plans to erect in all fifty dwellings.

A four-room addition to the public school at Preston, Ont., will be erected during the summer.

Plans are being prepared for a new factory building to cost $250,000, for the Holeproof Hosiery Co., of London, Ont.

Architect W. G. Murray, Dominion Savings Buildings, London, Ont., is preparing plans for a new sixteen-roomed school, for the school board at Ingersoll, Ont., to cost $95,000.

A by-law was carried by St. Thomas ratepayers, to expend $8,000 on the erection of a new pavilion at Pinafore, and the installion of lavatory accommodation.

MOVE TO NEW PREMISES

Crane, Ltd., Montreal, have moved to their new premises at 1280 St. Patrick Street, Cote St. Paul, Montreal. The offices will also be there on and after May 30, and the new telephone number is Victoria 1409.

In speaking with Mr. E. C. Townsend, the manager, he intimated that the premises would shortly be completed. The new quarters will provide for a more expeditious handling of orders.

NEW TIMMINS FIRM

Alex. Simpson and G. Hicks, formerly of Haileybury, Ontario, but recently employed in the mechanical department of the Hollinger Gold Mine, have opened a new plumbing shop on Spruce Street, Timmins, Ontario. They intend to make a specialty of sheet metal work, plumbing and heating systems. Both Hicks and Simpson have seen service overseas.

ONTARIO DELEGATION TO MONTREAL

A special car has been secured to take the delegates from the Ontario Society of Domestic Sanitary and Heating Engineers from Toronto to Montreal for the Dominion convention. The delegates from points in the district will join the Toronto delegation at Toronto. A good attendance is expected. Among those who are going will be F. R. Maxwell; T. Ferguson, president of the Toronto branch; K. B. Allison, vice-president; T. Maxwell, treasurer; George Clapperton, E. Lewis LeGroh, Lou Calder, Charles Chapman, Ross Belyea, John Cracknell, and Garrett Frankland, of Toronto; President Thomas Minnes and C. D. Henderson, of Brantford; Vice-President George E. B. Grinyer, H. Mahoney, and A. Malcolm, of Guelph; E. H. Russell, A. Gibbons, Ben Noble and John Eggett, of London, Ont.; Dominion Vice-President C. R. Myers and Angus McDonald, of Stratford, Ont. There will also be delegates from Hamilton, Kitchener, and other points.

Who the new Dominion president will be is a matter of speculation. Among three of the best guesses are said to be Vice-President Clove R. Myers, of Stratford; Vice-President Garrett Frankland, of Toronto; and Frank R. Maxwell, past president of the Ontario Society.

Believing that there will never be a better opportunity than the present for organization work all over the Dominion President T. J. Minnes and Secretary G. F. Frankland plan to urge upon the convention the importance of undertaking this work and following it up energetically. They will also present reports from the Ontario Society showing what has been done and what it is planned to do.

A pressing invitation was extended to John W. Bruce to attend the Montreal meeting and give an address. Owing, however, to his duties in connection with

the Industrial Commission, which is now hearing evidence at various points in the Dominion, it is not likely that Mr. Bruce will be able to attend.

OTTAWA CONVENTION DELEGATES

Ottawa plans to send at least seven members to the Dominion meeting in Montreal, and it is expected that several others will go. Those who have signified their intention of attending are Messrs. Archambault, Gauthier, McKinley, Band, Blyth, Chapman and Chandler.

DRAUGHTSMEN'S ASSOCIATION GETTING UNDER WAY

At a meeting held in Sons of England Hall, Berti and Richmond streets, Toronto, further steps towards organization were made following the two previous meetings held recently.

The aim of the new association appears to be to organize the draughtsmen of Canada of every branch of industry into one association. At the last meeting Mr. Cranfield, of Peterborough, was present, with 10 names to be included in the membership. A motion was made that this association be called the "Draughtsmen's Association of Canada," but this was struck out, due to their intention to ultimately affiliate themselves with the American Association. It was brought out that a Draughtsmen's Association has already been formed in Montreal.

Mr. Lansing, in addressing the audience, gave his views, in which he exhorted those present to join this association, because of the position in which it would place them to obtain better working conditions from their employers.

Discussion of this point revealed a feeling that this should not be the principal aim, but rather to cement the draughtsmen into closer relations with each other. The following officers were elected:

Mr. Lansing, president; Mr. Pennington, vice-pres.; Mr. Goodwin, financial sec'y; Mr. Frank Brown, recording sec'y; Mr. Perry, treasurer; Mr. Patterson, sergeant-at-arms; Mr. Riggs. warden.

Executive:—President and financial secretary; also Mr. Leeming, electrical engineer; Mr. Browning, marine architect; Mr. Riggs, mechanical engineer; Mr. Pattison, heating and sanitary engineer; Mr. Beddell, civil engineer.

TIN PLATE MILL FOR TORONTO?

Negotiations have been carried on for some time past between Baldwins, Ltd., the Imperial Munitions Board, and the Harbor Commissioners relative to the purchase of the plant of the British Forgings at Toronto.

Baldwins, Ltd., will establish a large tin plate mill in Toronto if the negotiations come to a satisfactory conclusion and would use the electric furnace equipment of the present plant in the making of the steel ingots for tin plate.

The plant of the British Forgings, Ltd., Toronto, which is the largest electric furnace plant in the world, was erected in the spring of 1917 by the Imperial Munitions Board for the manufacture of shell forgings for the British and Allied Governments.

CONVENTION NOW IN PROGRESS

BY the time this issue of SANITARY ENGINEER reaches its readers, the convention of the Canadian Society of Domestic Sanitary and Heating Engineers being held on June 3 and 4, will be in full progress in Montreal. From all accounts there will be a very good attendance and it is the belief of the officers and executive that much good will be accomplished. The aims of the Society towards organization and co-operation are worthy the assistance of all members of the trade and great good should result from these get-together meetings. It is not only the Dominion body that is being pushed so aggressively, but the local organization in your own town is the ideal being sought by those in charge of the Society's affairs. A complete report of the proceedings will appear in the next, the June 15, issue of SANITARY ENGINEER.

APPOINTED EDITOR GAS JOURNAL

Geo. W. Allen, of Toronto, has been appointed editor of the Intercolonial Gas Journal of Canada, published at Hamilton. Mr. Allen's association with the electrical and gas trade began in Toronto some 18 years ago. From there he went to Brantford, Ont., where he went into the general and gas contracting business, superintending the installation of work on many public buildings and being one of the leaders in developing the use of natural gas in Western Ontario. Mr. Allen moved to Toronto in 1909 with the Consumers' Gas Company, moving up to the position of advertising manager and superintendent of employment. His many friends will join with SANITARY ENGINEER in wishing him success in his new field.

EXPORT BUSINESS DEVELOPING NICELY

With a view to further development of export business, H. C. Crow, sales manager of the Canada Metal Co., Toronto, is leaving shortly for England. While there he will go thoroughly into the situation.

"Our export business is getting to be something really big," said Mr. Crow, in discussing conditions with SANITARY ENGINEER. "We have had any number of inquiries and are still getting them, and a large percentage of them have developed into excellent trade. I am satisfied that there is lots of business to be had and that the way to get it is to go after it. While we look after any inquiries that come to us through the Trade Commission and similar sources we do not rely upon them for getting trade. We depend upon our own men for getting results both at home and overseas. The way to get business is to go after it either here or over there."

Mr. Crow stated that business is developing nicely in South Africa, New Zealand and other countries as well as in England, and he looks for it to grow steadily.

"Business in all lines is particularly good," he said, "and there seems to be a large demand for nails."

Discussing the general outlook, he gave it as his opinion that prices are going to be firmer.

BRITAIN TO DISPOSE OF STEEL IN STATES

Disposition of approximately 91,200 tons of rolled shell steel billets, owned by the British War Mission, in the United States at $34 per long ton, is planned by the British War Mission, the American War Department announces.

MAY REMODEL INSANITARY HOUSES

Controller Jutten, of the Hamilton, Ontario, City Council, is proposing that the rent of all houses unfit for habitation be collected by the city and that it be used to place the buildings in a habitable condition. As soon as the cost of the work, often very small, is covered, the rent would again be paid to the landlord. This would seem to be a way out of many difficulties regarding insanitary houses. The housing situation is acute and every house is needed.

FOUNDER OF TRADE POOLS IS DEAD

Edwin E. Jackson, Jr., who was well known some years ago as an organizer of business combinations and trade agreements and pools, died this week at his home in Brooklyn at the age of 52. Mr. Jackson, while a member of the law firm of Noble, Jackson & Hubbard, put through a pool agreement to control both the output and price of wire, but in 1911 all the members of the association were found guilty of violating the Sherman Anti-Trust Law and were forced to dissolve the pool and, in addition, had to pay heavy fines to the Government. In this case, Mr. Jackson was fined $5,000

on each of nine counts, or a total of $45,000.

Mr. Jackson also organized the so-called "Bath Tub Trust" and the "Electrical Trust," which were also forced to dissolve in 1911 as a result of the suits which were brought by Attorney-General Wickersham under the Sherman Act. It is said that at one time Mr. Jackson and his associates managed no less than 50 different trade pools which in the main were designed to create monopolies and do away with all outside competition, but owing to the firm stand taken by the Government, they were all abandoned.

The Waterbury copper average is one of the few trade innovations introduced by Mr. Jackson, which has survived, but this is still issued each month and continues to be used quite extensively as a settling basis on copper products.

VENTILATING THE MODERN SCHOOL

(Continued from page 32.)

70 degrees Fahr. above. These calculations are figured for a pressure of 5 pounds at the steam gauge.

When arranging to lay out these heaters due regard must be paid the provision of sufficient free area for the passage of air through these heaters with the minimum of friction. The velocity of air being 314 feet, a free-way of 4 square feet should be provided between the heater sections. This four square feet might seem to be inadequate when compared with the 6 square feet of the flue area, but one must consider that as the weather grows warmer and the air velocity through the heater becomes correspondingly less, the higher temperature affected results in the opening of the by-pass shown on the sectional drawing, thus resulting in providing a full free-way of 6 square feet from the heater chamber.

We are now in possession of sufficient data to lay out the fresh air flues together with the indirect radiators.

The foul air flues in this school are to be built up to, and through the roof, and if our design called for the connecting of these flues into a common outlet it would be necessary to instal equalizing those on the less side. The ventilalting flues so that those on the windward side of the building might "draw" as well as thouse on the lee side. The ventilating flues take the air from the class-rooms at the floor line and on the same side of the room as the fresh air flue makes entry. All ventilating flues should be fitted with dampers for the purpose of closing the flue when the class is not in session.

When installing a gravity system of ventilation it is advisable to provide for the summer use of the system by leaving an opening in each vent flue close to the ceiling, this opening being closed by a damper during winter months.

1. Always provide more than one cold air inlet to each heater chamber. These inlets should be set in such positions that either may be used as required by the direction of the outer air currents. Thev should be fitted with the back draft dampers so that a blow down will not drive the air back up through the cold air inlets.

2. The tops of the indirect radiators must not be set within one foot of the ceiling of the heater chamber.

3. The vent flues must be fitted with dampers, and in some cases with "back draft" checks.

4. The bottom of indirect radiators must be at least 24 in. above the water line of the boiler (more if possible) and their returns must be fitted with swing checks.

5. All air passages must have clean-out doors or other means of access so that these chambers may be readily inspected.

6. Where sufficient funds are available automatic temperature control should be included in the specification for a system of this description, and be sure that the automatic control covers everything required, including the operation of the tempering dampers in the fresh air flues.

SYSTEMS

(Continued from page 30.)

that a chimney will pull sufficient vacuum to draw vapor through a system of piping. He knows that it is a pretty strong chimney that pulls more than two-tenths of an inch of water, and that a pull of that strength will not go very far in a heating system.

The thoughtful engineer pauses to investigate everything that may come his way in the nature of his business, but while keeping his mind open for new things he is not carried away by innovations to such an extent that in practice he becomes a faddist. He listens with patience to a salesman extolling the particular virtues of his wares and weighs with care his somewhat extravagant assertions.

Happily for the public most men engaged in the installation of heating materials have kept clear of entangling alliances with manufacturers, and as a result there are very few cases where the men installing heating systems have an entirely mercenary object in advocating any one type of system for all kinds of buildings.

A few apprentices have graduated into the ranks of journeymen without ever learning the fundamental principles underlying the practice of their trade. They know that for a certain class of work fittings are always installed in a certain way, but their understanding of the reason is very vague. They have been taught that pipes should run in the most direct way from boiler to radiators, and when they come to make an installation where the plans have been laid out with a regard to equalizing the circulation at some particular part of the building, they can only believe that a mistake has been made, as certain radiators close to the boiler are set so as to be taken off the end of the main. When these men once grasp the principle of the design of that type of system they hesitate a long time before taking liberties with the engineer's layout.

Two of the things the fitter must keep forever in mind when installing any system of steam piping is that provision must be made for the drainage of condensation and for the expansion and contraction of pipes. Be sure to keep your lines free from condensation or air pockets and your water lines free from traps. Remember water will not flow uphill; it must be pulled up or lifted.

When your lines are all properly graded see that they are properly supported so that the grades established may be always maintained.

The adoption by many industrial firms of a first aid department presents an opportunity for business for the aggressive sanitary engineer. This is a view showing a portion of the first aid department of the firm of Massey-Harris Co. of Brantford, Ont. This is in charge of Miss Slee, who reports an average of 30 cases per day passing through her hands. Everything is finished in white and the room contains all the necessary plumbing equipment, medicine cabinets, etc., which form a part of such a department.

Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

NATURAL VACUUM SYSTEM

Question:—A friend of mine is contemplating the installation in his building of what he claims to be a vacuum system of heating. Any vacuum systems that I have worked on had a pump pulling on the returns. The plans my friend has do not show a pump, and it looks to me as though he is only getting an ordinary two pipe system with a vent on the end of the dry returns. Will you please explain how this system can be a vacuum system?

Answer:—The system you refer to has been designed on a principle that can best be explained by the use of the following illustration: Imagine a steam boiler set up in the basement and this boiler connected to one radiator on the ground floor. The piping connections are a feed to the top of the radiator and a return at the bottom. The air vent opening for the purpose of this experiment has a pet cock in place of the ordinary air vent, and a compound pressure and vacuum gauge is connected to some part of the radiator. Now when steam is generated in the boiler it passes up and into the radiator, drawing the air out ahead of it through the opened pet cock in the air vent. When steam begins to flow freely through the open pet cock the pet cock is closed, and if the fire is kept burning in the boiler the pressure gauge registers in pounds the steam that is being developed. If the fire is checked at the boiler the steam pressure begins to drop and the indicator on the gauge turns back until it has passed the zero mark and registers, on the vacuum side, the number of inches pulled. It may go back to 10 or 12 inches and the radiator be still hot. If the pet cock had been opened at the time the fire had been checked no vacuum would have been registered and the radiator would have been cold when the gauge registered at the zero mark. Now that is the principle of the system that your friend intends installing. The whole secret in the establishing of the vacuum is in the air vent closing against the return of the air.

The plans supplied must be rigidly adhered to as valves graduated in size to suit certain radiators are used. A system of that kind requires great care in the installation and selection of materials, and if you instal the system be sure that you have sufficient grade in all of your pipe lines.

* * *

BOOKS ON PLUMBING

Arthur F. Betts, Fredericton, N.B.—Please give names of books which you can supply dealing with plumbing and heating. I have a returned soldier with me who is being given an eight months' course in plumbing and heating by the military authorities. I am anxious to help him as much as possible.

Following books may be secured through the technical book department:

Plumbing and Heating, Practical Wrinkles for the Plumber, $1; Plumbing, $1.50; Country Plumbing Practice; $2; External Plumbing Work, $2.50; Cont. and Estimate Record Book for Steam and Hot Water Heating, $1; Plumbing Plans and Specifications, $3; Practical Plumbers' Work, 75c; Five Hundred Questions and Answers on Steam Fitting, $1; Gray's Plumbing Design, $4; A Successful Way to Operate a Heating Plant, 50c; Record Furnace Handbox, $4; Steam Boilers. $4; Sanitary Sewerage of Building, $1.50; Sanitation in the Modern Home, $2; Hot Water Manual, $3.50; Steam Boilers, $1.

We would also suggest that if you are not already receiving two copies of SANITARY ENGINEER you subscribe for an additional copy for this young man. In this way he will be able to keep right up to the minute regarding what is going on in the trade. He will also be practically interested in the present series of articles by Mr. Kearns, which are being widely commented upon by the best men in the trade.

NEED MANY HOUSES

LONDON, ENGLAND—The Government has ordered 800,000,000 bricks for the housing scheme, and it is reported that there are now more than enough bricks on hand to meet all existing demands. Explanatory pamphlets are going to be issued by the Local Government Board, illustrating how the best advantage may be taken of the scheme by the general public and local authorities. But no houses have as yet been built.

A speaker addressing a public meeting the other day said if people are foolish enough to pay $1,000 for army huts which cost $300, they may be able to get them.

MARKET CONDITIONS AND TENDENCIES

(Continued from page 36.)

here are now ranging from 6½ to 7c per pound.

ANTIMONY.—A recreation upward is noted in this metal also this week, quotations now ranging from 8½c to 9c per pound. There is a better demand, and this is being met from ample stocks, though supplies here are not considered heavy and reports from primary points reveal no excess stocks.

ALUMINUM.—There are some grades of aluminum that are reported scarce at primary points, and it has taken very little of a buying movement to make this fact apparent. There is only a nominal interest being shown as yet in this metal locally, with quotations ranging around 40c per pound.

PIG IRON.—A distinctly better feeling is apparent since the United States Government discarded its price-fixing plans and buying is assuming better proportions. Some factors predict a bull market when Government buying for the railways begins again, which they claim it must do at an early date.

Heating and Ventilating

SYSTEMS

Fifth Article of Series Prepared for Readers of "Sanitary Engineer" by N. A. Kearns

Editor's Note.—This article is the fifth of a series prepared especially for the readers of SANITARY ENGINEER, covering heating and engineering practice reduced to its simplest terms. Readers will find this article on the "Systems" a most interesting and illuminative one. The first article of the series appeared in the April 1 issue. Descriptions of installations made in different classes of buildings will be given, together with the method used in making the designs for these installations. It is not our purpose to give complicated formulas, but rather to present the simple rules that have been based on these formulas, in such a way that the reader will be enabled to design a heating and ventilating system without having to refer to the data given in engineers' hand-books. The author of these articles, Mr. N. A. Kearns, has designed heating and ventilating equipment for all classes of buildings in practically every province of the Dominion. Some of the buildings were such that the heating and ventilating equipment had to be installed under the most adverse conditions, whereas in other buildings the design for the heating and ventilating equipment was incorporated in the constructional drawings. The sixth article of the series will appear in the next issue.

It is almost with a feeling akin to hesitancy that we approach the subject of piping for steam and hot water heating plants. We believe that some of the statements that we find necessary to make may involve us in a controversy with some reader who believes that one and only one system of piping is the best for any and all conditions, without regard to circumstances.

A picture comes before us of a fitter asserting that some engineer knows nothing of his business because that engineer had made a specification for a two-pipe steam job. In the opinion of that fitter the only sensible system to instal is the one pipe. This man certainly has some wonderful results with the one-pipe system as his knowledge of the details cover every requirement. He is, in fact, a specialist in that class of work and has knowledge of no other.

Another man comes along and swears by the two-pipe system. In it goes, in big buildings, little buildings, schools and churches, warehouses and convents, green houses and sanitariums. no matter what he is called upon to do the two pipe system is forever in his mind.

Many men look askance at the use of pumps or any mechanical device in connection with heating systems. Others cling to these pumps as to a life preserver. One man claims that no supply pipe should be run overhead, another that they should not be run in any other place.

Forced hot water heating systems have their partisans, and also those who condemn them in the most vigorous language.

If one did not know that the assured assertiveness of these men came from the conscientious belief of their superior knowledge an effort might be made to enter into argument with them, but as they are never ready to grant that one differing from them may have, at least, a little intelligence, it is extremely difficult to get anything more from them than a violent expression of their opinion.

I believe that the engineer with a thorough knowledge of his business would instal heating plants in the various types of buildings thus:

(1) In residences he would prefer to instal hot water systems. He would pipe a small, square building where the boiler may set approximately in the centre of the basement, in such a way that he could use individual mains for ground floor radiators and the risers, On the other hand, if the building was long and narrow, with the boiler set at one end of it, it is likely that he would prefer the system of piping where the radiators and riser branches are fitted to the flow and return mains in such a manner as to equalize the circulating effect.

(2) In a small greenhouse he would instal a gravity system of hot water heating, using large pipes as radiating surfaces. In a large building of the same nature he might instal a forced hot water heating system. But before advocating any system he would make it a point of finding out just what kind of plants were to be grown, as it might be advisable, under certain conditions, to have a steam heating system installed. Greenhouse heating is one of the most difficult problems with which the heating engineer has to deal, and one of the safe rules to follow is to be sure that the heating system of a large greenhouse is kept separate and distinct from that of any other type of building.

(3) In a church he might advocate a forced blast system of heating. This would also apply to theatres and all other auditoriums with the exception of those used for moving picture plays.

(4) In hospitals he would instal a vacuum steam system plant or a hot water heating system, preferably piped for forced circulation, and if a steam boiler was used therein for heating the coils in the ventilating chamber, or for any other purposes, he would use a reheater or a converter, thereby utilizing steam to heat the water circulated in the direct radiators.

(5) It is likely that he would recommend a vacuum circulating system of steam heating in a factory building of fairly large dimensions, and he would use an electric pump in preference to that of any other type. Small factories he would pipe for either one or two pipe gravity systems as the circumstances demanded. If the use of coils were advisable the two-pipe system would be necessary. If a number of small radiators were to be used a one-pipe system would be that advocated. If the building was fairly high and he was using a one-pipe system, he would certainly drip the risers.

(6) His belief is that the system best adapted to office buildings is that of a two-pipe mechanically induced vacuum.

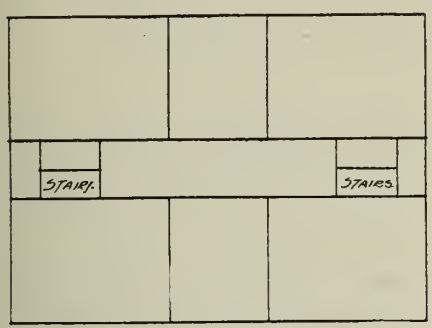
(7) When he uses air vents and connects them to an air line his judgment does not prompt him to connect the air line to the chimney. He does not believe

(Continued on page 28)

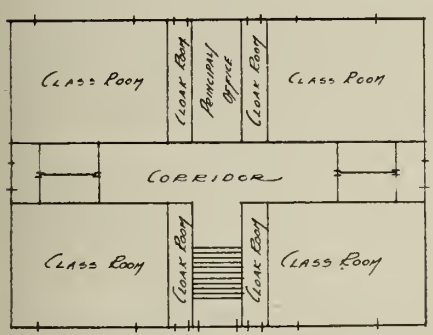
Ventilating the Modern School

Fourth Article of Series Written Especially For "Sanitary Engineer" by N. A. Kearns—First Article of Series Appeared in April 1 Issue

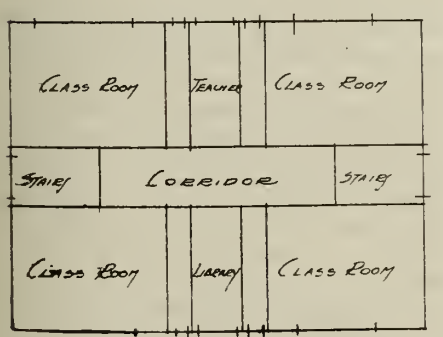
WE are now ready to lay out the ventilating system for a school building, and for our first example take the problem of a school with eight class rooms. The system to be installed is for gravity circulation, using indirect radiation for heating the air for ventilation. The plan first comes to our attention in the shape of a rough diagram, thus:



BASEMENT



GROUND FLOOR



FIRST FLOOR.

It will be noted that the architect has not indicated the position of the boiler room nor the location of any of the ventilating flues; this he has left for the consideration of the heating and ventilating engineer, and in doing so he has mentioned that the roof of the building is flat and surrounded by a parapet wall 4 feet high. The information regarding the type of roof is quite necessary, as in the absence of such the ventilating flues might be run in a location that would interfere with the constructional details, or the architectural design of the building. In this connection it might be stated that in many school buildings the ventilating stacks have been made the dominant note in the architectural composition. This is especially the case where pitched roofs are used. Some designers group these flues in such a way that they seem to be absolutely necessary to the rounding out of the design, and where flues are designed in this manner architectural skill of the highest degree is manifested. Some styles of architecture demand as a feature a roof with a cupola or other ornamental tower, and in such cases these ornamental features may often be turned to good account as termination for the vent flues.

The plan we are considering indicates a flat roof, and therefore we do not have to give much thought to the appearance of these flues above the roof, other than to see that where showing above the parapet walls that they are set far enough back in the roof so as not to mar the appearance of the building.

Some reader may question the fitness of the subject of architectural design entering into and confusing the problem of the ventilating engineer. A question of this kind is almost sure to arise in the mind of that man who worships only at the shrine of utility, and who considers that so long as his work serves the purpose of usefulness he has fulfilled all of his obligations, but even men of that type must grant that people as a whole seem to have some appreciation for the appearance of good work, and therefore they, in doing their own work, strive to do it with a certain amount of neatness, yet these same men when they get hold of an architect's drawings for a building, instead of exercising their abilities in an effort to find some way of fitting their work to the architect's design, they, without a thought of the labor, time and study spent by others, rip the very bowels out of the building in an endeavor to have the only system that they know anything about installed.

The reader must not assume that when practising as a heating engineer he is to usurp the architect's function, but rather that he is to avail himself of every opportunity of consultation with the architect when laying out the main features of the ventilating design.

The greatest need of the average man is an open mind. In many cases it is the general disposition to incline favorably only to those things with which we are familiar, and one of the symptoms of this disposition is an unhealthy desire to keep the mind closed against the introduction of anything new; another symptom is the belief that when a man cannot appreciate one's point of view that he must be entirely ignorant of the subject under discussion. When one comes with an open mind to the consideration of the ventilating system for almost any class of a building he will find that as a rule it is not difficult to design such a system without interfering to any great extent in the architect's lay-out. And when there are occasions where we must ask the architect for some modification in his design so as to permit of the satisfactory solution of the problem of ventilation, it is likely that our requirements will be such that the very necessity of providing for them will open the way to some feature that may be incorporated in the architectural design. For example, we may take the fresh air inlet, which is to be situated at the front of the building and above the dust line; here is a case where the utilitarian would run up a square flue at any place convenient without regard to appearance, while the thoughtful designer would make that very emergency an opportunity for architectural expression.

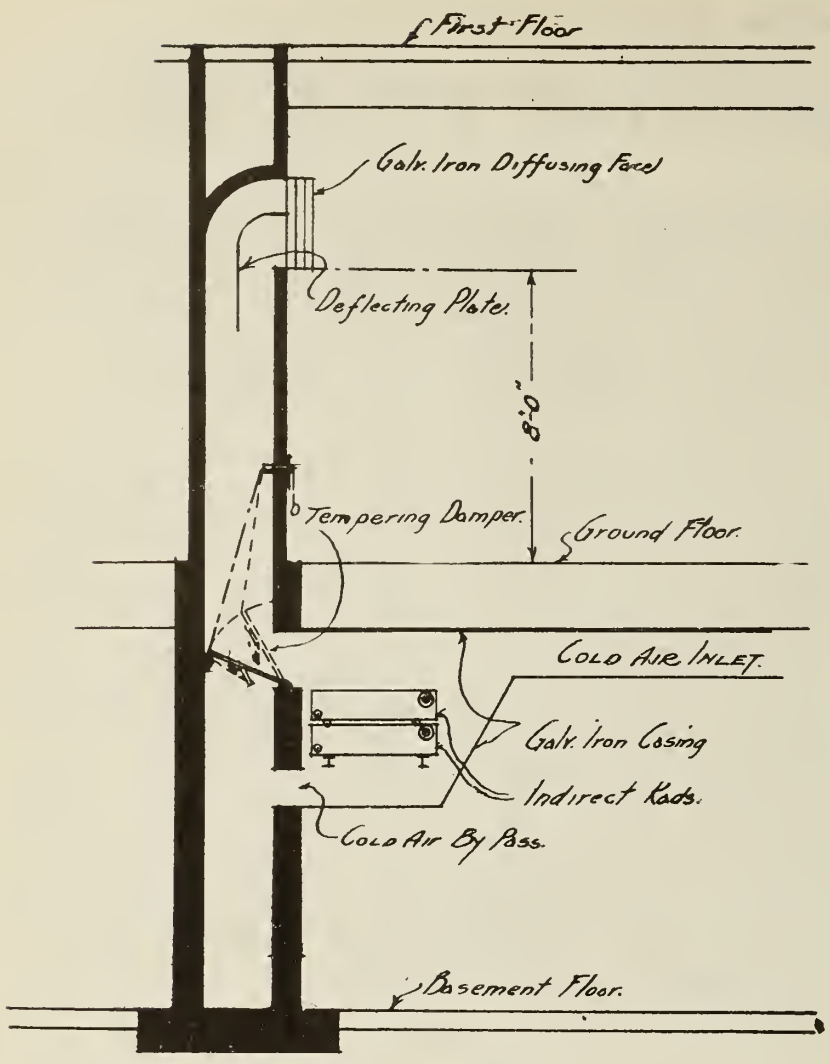
To return to the ventilating design for the building; we find that, in referring to the plans, the storey heights are given in the dimensions from floors to ceilings, thus:

Basement	10 ft. 6 in.
Ground floor	12 ft. 6 in.
First floor	12 ft. 6 in.

All rooms are 32 ft. long by 25 ft. wide. The windows are massed in each class room along the left-hand side of the pupils. The seating capacity of each class-room is for forty pupils and one teacher.

Now the first thing we are to take up is the size of the flues, and to ascertain the size of the flues we will make use of the data we have presented in former articles of this series. Referring back to one of these articles we find that 30 cubic feet of fresh air per pupil was set as a standard. There are forty-one occupants of each class-room so we estimate that the total amount of air required per minute is 1,230 cubic feet per class-room.

When we refer to the table (presented in the third article of this series) giving the velocities of air traveling in flues, we find that the capacities of flues vary with the temperature difference of the air in the flues and the external atmosphere, and also with the heights of the flues. So first we must decide on the flue heights. We refer to the architect's sketch and find that the vent flues may be made 40 ft. in height, this height being measured from the level of the top of the heating chambers in basement to the lowest point of the vent opening above roof. Next we decide on the air temperatures, and here is where judgment must be used in striking an average temperature condition as a basis for our calculations. The table gives the air velocities for temperature differences ranging from 10 to 100 degrees. Now if the flues should be proportioned for extremely cold weather they would be too small for adequate ventilation during warmer days, or if we used figures for a very slight temperature difference the



FRESH AIR FLUE.

flues would be extravagantly large. We may assume that as surely as there is a warm day during the winter the teachers in each of these class-rooms will raise the windows so as to effect the ventilation by this means rather than by using the ventilating system. It is altogether likely, therefore, that when there is a temperature difference of less than 15 degrees between the inner and outer atmosphere the windows will be opened, so for our purpose we assume a maximum ventilation requirement for nothing less than a temperature difference of 15 degrees. The table indicated that a flue 40 ft. high with a temperature difference of 15 degrees gave a velocity of 265 feet per minute. The flues are not continuous through the full height; there is a break in the height of the flues where they turn into the class-rooms before venting to the stack. There is also a change in the temperature condition and for these two reasons we must deduct about 25 per cent. from the rated efficiency. This makes the estimate of the flue velocity as being 204 feet per minute. The air requirement is 1,230 cubic feet per flue per minute, and when we divide the 1,230 by 204 the flue area required is found to be 6 square feet.

There are many schools where gravity ventilating systems are installed, not having flues nearly as large as these recommended here, but the writer knows from actual experience that a flue smaller than 6 square feet is not large enough for adequate ventilation with a gravity system. Remember that we are basing our figures on the assumption that the fresh air is to be delivered into the class rooms at a temperature never exceeding 72 degrees Fahr.

A flue 6 square feet, being the size required for fairly warm weather conditions, is too large for use in cold weather, so we place throttling dampers in the vents for the purpose of keeping the flow of air within normal limits. The throttling dampers are usually controlled from the fresh air rooms in the basement. The reader must bear in mind that different conditions require different details of design and that circumstances often warrant the building of flues having areas greater or less than those based on the rules given in these articles. Once again we may state that judgment must be exercised in designing these flues, but when a person deviates from any set of rules he must be in a position to state clearly why he is doing so, otherwise he cannot expect to inspire much confidence in the mind of his client. Any of the rules given in these articles are well within a margin of safety, and unless the reader has had a great deal of experience in this class of work he should stay with the sizes that have been recommended.

The next thing to decide upon is the amount of indirect radiation required in heating the fresh air.

The problem is to heat 1,230 cubic feet of fresh air per minute from 10 degrees Fahr. so we multiply the E.G.S. of 1,419 above. The heat required for this per hour is as follows: 1,230 cubic feet multiplied by 60 equals 73.800 cubic feet to be heated per hour. (The figure 60 represents minutes). The temperature of the air coming in from outdoors is assumed to be 10 degrees below zero, and it is to be raised to 70 degrees above. Therefore, the average temperature of this air is 30 degrees above zero. The quantity of heat given out by one B.t.u. to air at this temperature is sufficient to raise 52 cubic feet of air one degree Fahr. so we divide the 73,800 cubic feet of air by 52 and find that this is equal to an equivalent glass area of 1,419 square feet (the function of the equivalent glass area and heat loss calculations was described in detail in the first article of the series on heating, under the heading of, "The What, the Why, and the How of the B.t.u.").

The temperature range is 80 degrees Fahr. so we multiply the E.G.S. of 1,419 by 80 and find a total requirement of 113,520 B.t.u.'s for heating the fresh air for each class-room.

The next thing to do is to find the efficiency of the radiating surface, and to do this we will refer to the guaranteed ratings as given in the catalogues of manufacturers making radiators for this class of work.

As we have already learned the velocity of the air through the heaters has a bearing on the efficiency of these surfaces, we must establish a rate for that in estimating the heating area required. We have already based the flue velocities at 206 feet per minute, but that was for a temperature range of 15 degrees Fahr., and as the indirect radiation is to be figured for a temperature range of 80 degrees, reference to our table shows that this velocity is about 419 feet. deducting 25 per cent. from these figures on account of the break in the flue we assume the velocity as being about 314 feet.

The air is not to be heated to a temperature above 72 degrees Fahr., so the indirect heaters must not be more than 20 in. deep, if it should be made less than this, say 10 in. deep, the air would only be heated to a temperature of 40 degrees above zero instead of the 72 required.

The air passing over two sections of "vento" radiators at this velocity will take up 800 B.t.u. per hour, and in dividing 113,520 B.t.u. by 800 we find that 142 square feet of indirect radiation is required to heat 1.230 cubic feet of air per minute from 10 degrees below to

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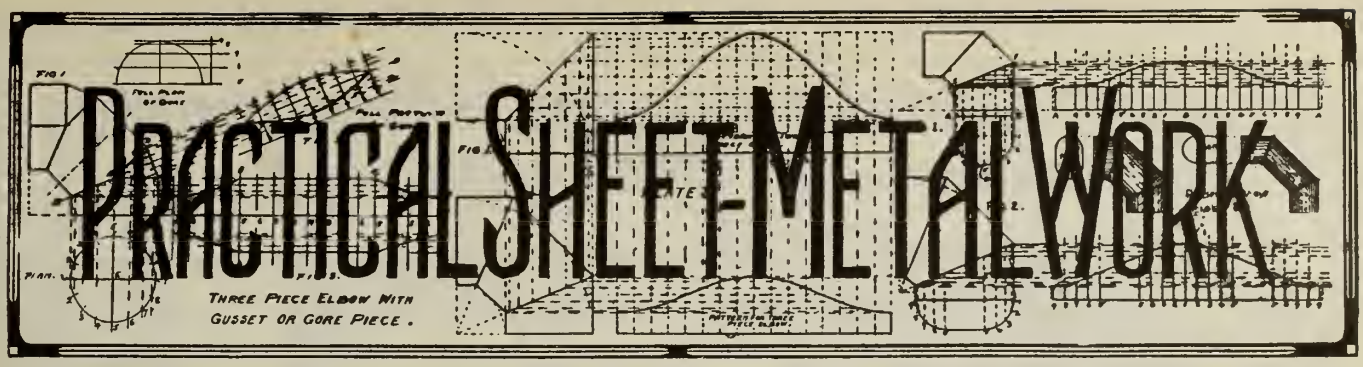


BY THOMAS STANSFIELD

THE accompanying plate shows quite a variety of seams, locks and joints that can be made in the construction of square or rectangular ducts. Some will require the use of a brake, while others can be neatly made without.

Of course, any of these would look neater if machine turned. Fig. 1 shows a rectangle pipe with one lock only, Fig. 2 one with two locks, which would add strength to the pipe.

Fig 3 type of pipe or duct is generally made in this way when heavy gauge material is required. A shows an enlarged section of a finished corner. It will be seen that the sides are turned over after being riveted.

Fig. 4, too, is a type generally made up of heavy iron, with corners made of angle iron. Sometimes this type of duct is made of light sheet metal, and the angle iron is used not only to make the corner of, but also to stiffen the whole duct.

This is another article of the series on Sheet Metal Work by Thomas Stansfield, which have been widely appreciated by the trade. Next issue will contain the concluding article.

Fig. 5 is a simple type of duct easy to make in either light or heavy sheet metal when rivets are used, or even stove bolts.

Fig. 6 is a duct describing a very simple yet strong double lock, which when complete, and the raised double edge turned over and soldered, makes a neat job. A shows an enlarged section of the finished seam.

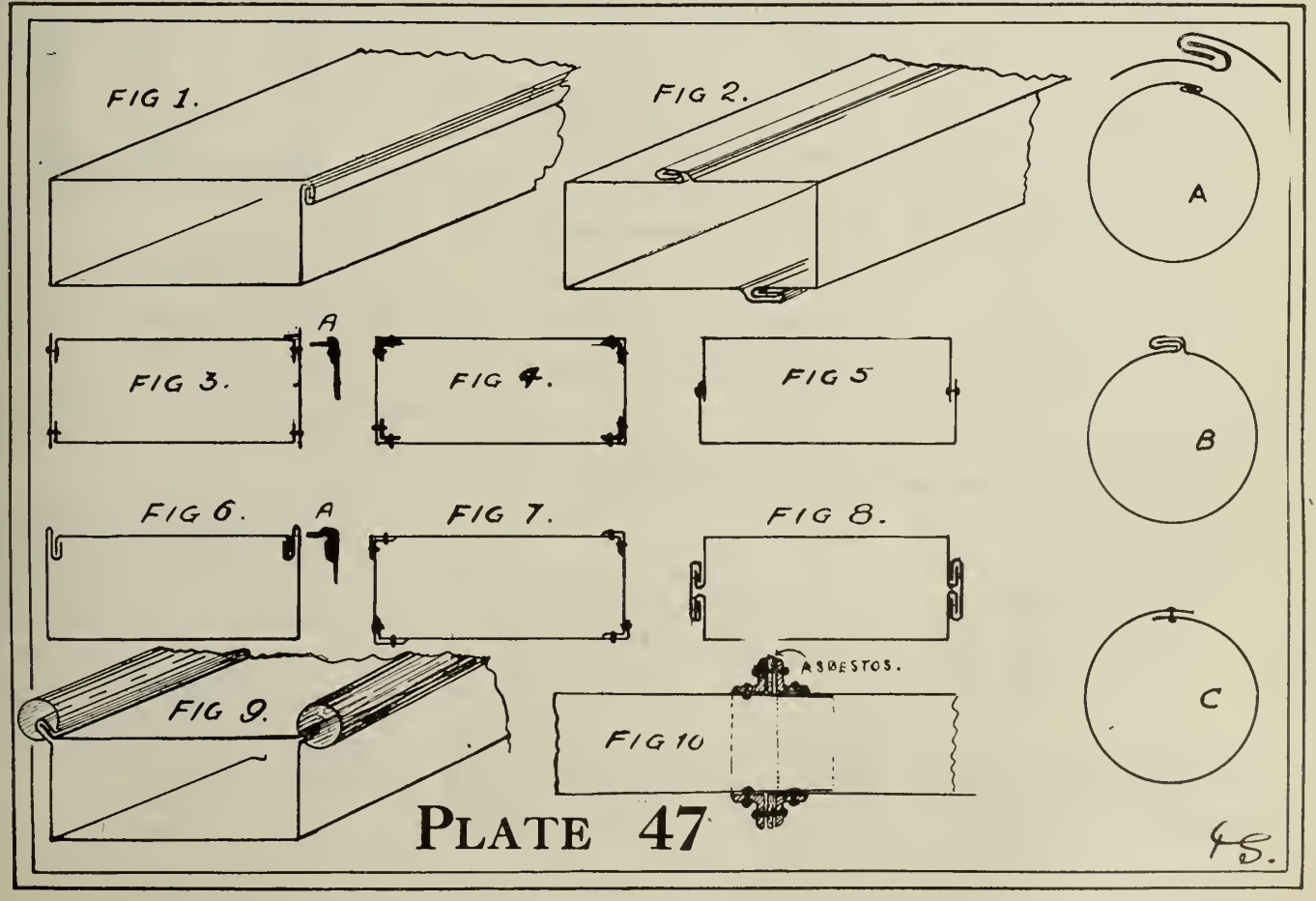
Fig. 7 is another type of duct generally made on heavy material and riveted; the joints can be made very rigid, and stand in place by using angle iron.

Fig. 8 is a rather uncommon type of duct; the joints are made by using a turned slip piece, which holds the two sections together. The joints can be staggered if required, and short pieces of material can be used.

Fig. 9 shows a style that can be used very advantageously where a warm air duct has to pass up through a room on the outside of a wall. There are no joints visible, the corners being made of round tube.

Fig. 10 shows how the joints of warm air heating or fan ducts can be connected together, a piece of asbestos or other material used that will tend to deaden the sound, as well as make the connections fairly well air tight.

(Continued in next issue).



Market Conditions and Tendencies

STATEMENTS REGARDING SUPPLIES AND TREND OF PRICES

THE MARKETS AT A GLANCE

INTEREST is again becoming more centred around ingot metals than perhaps any other single item in the markets. A general reaction to higher levels has occurred, tin, lead, spelter and antimony all being affected. The advance on tin approximates 2c per pound, on lead and antimony ½c, and on spelter ¼c.

This follows on the heels of a resumption of buying, and the fact that buyers, besides specifying for spot deliveries, are in some metals placing orders for future shipment, would indicate that manufacturers' stocks are by no means large. Locally stocks are considered very good and the feeling prevails that even slightly higher prices may be realized during the next sixty days.

A decline of 25c per 100 pounds in blue annealed black sheets, 16 gauge and heavier, has been made this week. No revision on other gauges is reported and galvanized sheets have been maintained on a very steady basis. Jobbers report sales as very good with the outlook promising for a much increased turnover.

The situation in sheets seems to be firming up along with other steel and iron products and indications seem to be that any move in the future will be to higher levels.

Manufacturers of enamelware indicate that there has been no revision in prices and do not anticipate any in the immediate future. Production at the present time is at a pretty low ebb and until this can be speeded up very materially, it is indicated there can be no downward move.

The situation in range boilers may be affected by the developments in the United States, where competition has brought about a lowering of values, although it is thought this is only a flurry which will not continue. In the meantime there is no change in the market here.

Business generally shows improvement, though the uncertainty in the labor situation is tending towards restricted buying until atmosphere is cleared somewhat.

TORONTO, May 29.—Ingot metals are the chief item of interest in the markets since last issue, with many lines showing an upward trend. Black steel sheets, 16 ga., and heavier, are down slightly, but tendency in the market is towards higher levels. A little interest developed in scrap metals last week, but not enough yet to provide for a real optimistic feeling. Range boilers may reflect the decline registered on the other side of the line, though there has been no change yet. Business is improving and outlook considered encouraging.

No Changes Shown In Range Boilers

RANGE BOILERS.—While there has been a change made by American firms to slightly lower levels in range boiler prices, this is regarded merely as a temporary condition that will not affect the Canadian quotations. Business has been coming in nicely and many inquiries indicate that market is likely to remain steady. The quotations are:

Range Boilers	Standard	Extra Heavy
30-gallon	$12 25	$14 50
35-gallon	15 00	17 00
40-gallon	18 00	20 00
52-gallon	24 00	28 00
66-gallon	33 00	38 00
82-gallon	40 00	47 00
100-gallon	50 00	58 00

Enamelware Lines All Holding Firm

ENAMELWARE. — Predictions in some quarters that enamelware lines were likely to be revised to slightly lower prices have so far failed to materialize. Increased activity in the business is being shown with prospects that there will be a very fair season. One of the big factors which is operating to keep prices firm, is that manufacturers are working at limited capacity. Until business is such that they can materially increase their output and lower their production cost, little change is expected. The quotations on a few well-known lines are:

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Basins, flat back, 14 x 15 in.	6 45
Do., corner, 15 in.	7 15
Sinks, roll rim, 18 x 30 in.	15 05
Sinks, flat rim, 20 x 30	6 47 6 35
Do., 18 x 30	5 62 5 50
Do., 18 x 24	5 12 5 00
Do., 16 x 24	4 92 4 80
Do., 14 x 20	4 25 ....
Closets, oak tank and seat	25 50
Do., enamel iron or white vitro tank	27 50

Soil Pipe Prices May Be Advanced

SOIL PIPE, FITTINGS.—Owing to general conditions that may result from demands of labor for shorter hours and increased wages, there seems to be every indication that prices will be increased. While there is a fair stock in many lines, others are becoming so short now that dealers are unable to fill orders and do not know where or when they will get the goods required. They report that a large volume of business is offering and that if present labor troubles are cleared up soon the season should be a good one. Quotations are as follows:

Medium and extra heavy soil pipe, 2, 3 5 and 6 in.	20%
Medium and extra heavy soil pipe, 4 in.	25%
Medium and extra heavy soil pipe, 2 in. to 6 in.	35%
8 in. extra heavy pipe and fittings	15%

PIPE FITTINGS

Cast iron fittings	20%
Plugs	35%
Bushings	35%
Unions, ¼" to 2½"	50%
Do., ⅛", 3" and larger	45%
Dart unions, ¼-inch to 2-inch	25%
Do., 2½-inch and larger	15%
Nipples, up to 4-inch	60%
Do., 4½-inch and larger	50%
Do., running thread 4-in. and under	30%
Couplings, 4-in. and under	40%
Do., 4½-in. and larger	20%

MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittings, Class A, lb.	$0 50	$0 60
Do., Class B, lb. net	0 22	0 30
Do., Class C, lb. net	0 14	0 21

Brass Steam Goods Are Holding Steady

VALVES.—Conditions in many parts of the Dominion have resulted in business being a little quiet in steam goods, and until matters get straightened away no noticeable improvement in orders is looked for. Business in the lines required in marine work has been showing steady improvement. Quotations are unchanged.

Compression work, standard	50
High grade	49
Fuller work, standard	45
High grade	38
Basin cocks, No. 0 standard	40

MUELLER

Water, Gas and Brass Plumbing Goods

CANADA'S BEST

We wish to direct your attention to the fact that there is nothing in water, plumbing or gas brass goods practice that we do not manufacture. The test of over 60 years of producing nothing but the very best in these lines conclusively proves that we are the masters of such manufacture.

We are illustrating a few of our various lines and wish to direct your attention to the fact that—

Our 1919 Catalog A is ready for distribution.

WE MAKE:

1—Tapping Machines
2—Corporation Cocks
3—Goose Neck Connections
4—Ground Key Curb Cocks
5—Rapidac Bath Cocks
6—Rapidac Basin Cocks
7—Globe Valves
8—Drilling Machines
9—Regulating Valves
10—Meter Testers
11—Bath Supplies
12—Service Boxes
13—Basin Combinations and many other articles of highest quality.

H. Mueller Mfg, Co., Limited

SARNIA, ONT. CANADA

Nos. 1 and 2	40
Bath cocks, compression	50
Bath cocks, Fuller	45
Flatway stop and waste cocks, standard.	50
High grade	47
Roundway stop and waste cocks, standard	50
High grade	47
Brass steam cocks, standard	Net List
Globe, angle and check valves, standard.	23%
Do., removable disc	22%
Radiator valves, standard	31%
Do., removable disc	Net List
Basin Cocks—	
No. 0 and 1, Fuller pattern	45
Compression	40
Quick opening	50
Globe, angle and check valves, standard,	
medium pressure	23%
Radiator valves ,standard med. pressure	31%
Radiator valves, removable seat, medium	
pressure	25

Wrought Pipe Prices Remain Unchanged

WROUGHT PIPE. — Orders for wrought pipe have been coming through in increasing volume and prospects are that quite a nice season's business will be handled. Quotations remain unchanged and are as follows:

WROUGHT PIPE

Price List No. 39, April 3, 1919

Standard Buttweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
⅛ in.	$ 6 00	$ 8 00	$.....	$.....
¼ in.	4 53	6 66	5 13	7 26
⅜ in.	4 53	6 66	5 13	7 26
¾ in.	5 99	7 57	6 84	8 42
½ in.	7 53	9 66	8 68	10 81
1 in.	11 14	14 28	12 84	15 98
1¼ in.	15 07	19 32	17 37	21 62
1½ in.	18 01	23 10	20 76	25 85
2 in.	24 24	31 08	27 94	34 78
2½ in.	38 90	49 73	.....	.....
3 in.	50 87	65 03	.....	.....
3½ in.	64 86	81 88	.....	.....
4 in.	76 85	97 01	.....	.....

Standard Lapweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
2 in.	$ 27 94	$ 34 78	$ 31 64	$ 38 11
2½ in.	40 66	51 48	46 51	57 33
3 in.	53 17	67 32	60 82	74 97
3½ in.	66 70	83 72	75 90	92 92
4 in.	88 00	113 00	107 00	132 00
4½ in.	89 00	113 00	107 00	132 00
5 in.	103 00	132 00	125 00	154 00
6 in.	133 00	171 00	162 00	200 00
7 in.	175 00	224 00	211 00	259 00
8L in.	184 00	235 00	221 00	273 00
8 in.	212 00	271 00	255 00	314 00
9 in.	254 00	324 00	305 00	376 00
10L in.	235 00	301 00	283 00	349 00
10 in.	303 00	387 00	365 00	449 00

Terms, 2% 30 days, approved credit.

Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Boiler Tubes Maintain Position

BOILER TUBES—With a fair volume of business being handled there are no price changes noted and none are in immediate prospect. If anything, the market for the future will be inclined to be firm. Present quotations are:

BOILER TUBES—	Seamless	Lapweld
1¼ inch	$27 00	$.....
1½ inch	28 00	.....
1¾ inch	30 00	26 00
2 inch	30 00	26 00
2¼ inch	33 00	28 00
2½ inch	40 00	32 00
3 inch	46 00	38 00
3¼ inch	.....	45 00
3½ inch	56 00	42 00
4 inch	70 00	54 00

Waste Holds Steadily; Oakum, Too

WASTE, OAKUM.—The reaction in the market on cotton to higher levels is providing the waste market with a very strong undertone. This has not been reflected as yet in any price change upwards, and manufacturers as a whole are hopeful that it will not be necessary to revise quotations to a higher level again. However, indications are that present values are good in view of the situation in the cotton market, and whereas buying as yet is along rather restricted lines, there seems to be a somewhat better feeling in the placing of orders.

There have been no new developments in regard to oakum, and trade as yet is along rather narrow lines. Figures shown herewith are well maintained.

	Per 100 lbs.	
Best American	$21 00	$22 00
Clipper, spun	.....	21 00
Do., unspun	.....	10 50
Plumbers' spun	.....	9 50

Heavy Black Sheets Decline 25 Cents

SHEETS, PLATES. — Lower prices have been established in some quarters on blue annealed black sheets, 16 gauge and heavier, the decline amounting to 25c per 100 lbs. The present range of quotations is shown below.

Jobbers report a very good volume of business on all lines of sheets being done and indications are that this will continue and even increase if present enquiries develop into orders.

Sheet copper is being quoted for delivery from the mills at 24½c and from stock here at 27c per lb.

BLACK SHEETS—	Per 100 lbs.	
10 gauge	$4 75	$5 45
12 gauge	4 80	5 50
14 gauge	4 85	5 10
16 gauge	4 95	5 20
18-20 gauge	....	5 80
22-24 gauge	....	5 85
26 gauge	....	5 90
28 gauge	....	6 00
3-16 inch plate	4 90	6 25
¼-inch boiler plate	4 50	5 80

Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

GALVANIZED SHEETS—		
10¾ oz.	$7 80	$8 10
U.S. 28	7 40	7 70
U.S. 26	7 10	7 40
22 and 24	6 95	7 25
18 and 20	6 80	7 10
16	6 65	6 95
12 and 14	6 50	6 80

An extra is now charged on galvanized sheets, 10¾ oz. and 28 ga., when shipped out in sheets 3 feet wide. The extra charged over prices shown above is 20c per 100 pounds. Other gauges show no change for different widths.

Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

Solder Holds At Advance; Firm

LEAD AND ZINC PRODUCTS.—There have been no changes this week in any portion of the list, prices being very well maintained and a fair amount of business being transacted. Manufacturers intimate that with present labor troubles adjusted the orders should come tumbling in in great style. Quotations ruling are:

Lead pipe, lb.		$0 11½
Lead waste pipe, lb.		0 12½
Lead traps and bends		15%
Lead wool, lb.		0 14
Lead sheets, 4 to 6 lbs., sq. ft., in rolls, lb.	0 10¼	0 12
Solder, guaranteed, lb.	$0 35	$0 39
Solder, strictly, lb.	0 33	0 35
Solder, commercial, lb.	0 30	0 33
Solder, wiping, lb.	0 29½	0 32
Solder, wire, lb.	0 36	0 42
Zinc sheets, per lb.	....	0 17

Cut sheets ½ to ¾c lb. extra and cut sheets to size, 1c lb. extra.

Some Brass Figures Revised Upward

OLD MATERIALS.—There is a better feeling in metals which has been reflected here and a somewhat optimistic note is sounded by the dealers, though this is not very pronounced as yet. There have been some slight advances made in buying prices on brass, which will be shown in figures below. There seems to be a little business doing, but as yet this is rather restricted. Range of quotations for the week are:

Dealers' Buying Prices—		
Tea lead	....	0 03
Heavy lead pipe	....	0 04
Pipe scrap	....	8 00
Stove plate, per ton	....	10 00
No. 2 busheling	....	8 00
Yellow brass	....	0 07
Red brass	....	0 10
Light brass	....	0 05½
Scrap zinc	....	0 04½
Heavy copper	....	0 15
Wrought iron, No. 1, per gr. ton	....	15 00
No. 1 machinery cast	....	14 00
Heavy melting steel	....	9 00

Ingot Metals Reach Higher Levels

INGOT METALS. — Practically all along the line advances have been recorded, tin, lead, spelter and antimony recording slight advances. This is generally considered the result of a buying movement in progress, and not due to any depletion of stocks, which seem to be ample. Business in all metals seem much improved.

COPPER.—Primary points after recording some further slight advances as a result of an improved demand have eased away again. This has not yet affected the situation locally, but a slight reaction to higher levels seems possible. Quotations here are being made at 18c per pound.

TIN. — An advance has occurred locally, quotations ranging from 60c to 62c per pound. Stocks here are very good, and latest reports from United States points indicate that supplies in Government hands are much larger than anticipated. This will probably react against higher prices, although immediate declines are not anticipated.

SPELTER.—There is still only a fair demand for this metal, but a better feeling prevails as a result of the movement in the other lines. Prices locally show a range of from 8¼ to 8½c per pound, an advance of ¼c per pound.

LEAD.—At United States points an advance of $5.00 per ton has been recorded within the past week, and the movement upward is stimulated by the action of buyers coming into the market for fair spot quantities and specifying for even later delivery. This would indicate that stocks in manufacturers' hands are by no means heavy, though there is lots of lead available. Prices

(Continued on poge 29.)

A High Quality Hardware Line—

"Morrison" Brass Valves

They always satisfy the purchaser. The dealer experiences no come backs. Morrison Valves are made to last and when lasting work.

They are renewable disc valves, with heavy bodies, spindles and valves, and fitted with gland follower in packing nut.

You can sell Morrison Brass Valves in the full assurance of handling a quality product that will sustain the good reputation of your store.

The James Morrison Brass Mfg. Co. Limited

93-97 Adelaide St. West, Toronto, Ont.

"Anthes" Syphons Are Infallible

IT IS MADE IN ONE PIECE AND WILL NOT CORRODE

Write Us For Blue Prints Of Disposal Systems.

This type of syphon is endorsed by every sanitary engineer in the world. It is the only kind of flushing device known that operates under natural law. No moving parts to get out of order.

We Carry a Full Line of Soil Pipe and Fittings

ready for prompt shipments. Your jobber can supply you on short notice if he handles the **Anthes** line. Every order of goods shipped the day it is received.

Specify Anthes Soil Pipe, Fittings, and Syphons every time and you will procure both quality and service.

ANTHES FOUNDRY, LIMITED

TORONTO and WINNIPEG

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AIR LINE SYSTEMS
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AIR VALVES
Beaton & Cadwell Mfg. Co., New Britain, Conn.
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James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
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Wm. B. Scaife & Sons Co., Oakmont, Pa.
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Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Limited, Galt.
G. & W. G. Gummer Ltd., Rotherdam, Eng.
Kerr Engine Co., Ltd., Walkerville.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.
United Brass & Lead, Ltd., Toronto.
Wallaceburg Brass & Iron Mfg. Co., Ltd., Wallaceburg, Ont.

BRASS PIPE AND TUBE
Canada Metal Co., Ltd., Toronto.
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.
United Brass & Lead, Ltd., Toronto.

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Galt Brass Co., Limited, Galt.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

CHAIN WRENCHES
Trimont Mfg. Co., Roxbury, Mass.
J. H. Williams Co., Brooklyn, New York.

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Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Limited, Galt.
James Morrison Brass Mfg. Co., Toronto.
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Standard Sanitary Mfg. Co., Ltd., Toronto.
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DRINKING FOUNTAINS
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
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EJECTORS, STEAM
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James Morrison Brass Mfg. Co., Toronto.
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ENAMELWARE
Amherst Foundry Co., Ltd., Amherst, N.S.
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Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Limited, Galt.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Port Hope Sanitary Mfg. Co., Ltd., Port Hope.
Standard Sanitary Mfg. Co., Ltd., Toronto.
United Brass & Lead, Ltd., Toronto.

ENGINEERS
Modern Heating & Eng. Co., Ltd., Montreal.

ELECTRIC PUMPING MACHINERY
Empire Mfg. Co., Ltd., London and Toronto.
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Wm. B. Scaife & Sons Co., Oakmont, Pa.
Toronto Hardware Mfg. Co., Ltd., Toronto.
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Modern Heating & Eng. Co., Ltd., Montreal.

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Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

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United Brass & Lead, Ltd., Toronto.

FLUSHOMETERS
Canada Metal Co., Ltd., Toronto.
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Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Ltd., Galt.
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H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Standard Sanitary Mfg. Co., Ltd., Toronto.
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GASOLINE ENGINES
Empire Mfg. Co., Ltd., London and Toronto.
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Consumers' Gas Co., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brass & Lead, Ltd., Toronto.

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R. G. Long & Co., Toronto.

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McIntyre & Taylor, Toronto.

HEAT GENERATORS
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James Morrison Brass Mfg. Co., Toronto.

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Modern Heating & Eng. Co., Ltd., Montreal.

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Lord & Burnham Co., Ltd., Toronto.
Modern Heating & Eng. Co., Ltd., Montreal.
Steel & Radiation, Ltd., Toronto.
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McIntyre & Taylor, Toronto.

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R. G. Long & Co., Toronto.

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Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Hoyt Metal Co., Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brass & Lead, Ltd., Toronto.

MALLEABLE IRON CASTINGS
Gurney Foundry Co., Limited, Toronto.

MIXING VALVES
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Port Hope Sanitary Mfg. Co., Ltd., Port Hope.
United Brass & Lead, Ltd., Toronto.

MONKEY WRENCHES
G. & W. G. Gummer, Ltd., Rotherham, Eng.
Trimont Mfg. Co., Roxbury, Mass.

OVERALLS
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Canadian Wolverine Co., Ltd., Chatham.
Canadian H. W. Johns-Manville Co., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.

PACKLESS RADIATOR VALVES
Kerr Engine Co., Walkerville.

PIPE AND RADIATOR HANGERS
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Beaton & Corbin Mfg. Co., Southington, Conn.

PIPE, BLACK AND GALVANIZED
Canadian Tube & Iron Co., Ltd., Montreal.
Consumers Metal Co., Ltd.
Empire Mfg. Co., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.
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Borden Canadian Co., Ltd., Toronto.
Canadian Wolverine Co., Ltd., Chatham.
Chamberlain Desolvo Co., Ltd., Toronto.
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Canadian H. W. Johns-Manville Co., Toronto.
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Anthes Foundry Co., Toronto and Winnipeg.
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James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Toronto Hardware Mfg. Co., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.
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Borden Canadian Co., Toronto.
John Hall & Sons, Ltd., Brantford.
A. B. Jardine & Co., Hespeler.
Wells Bros., of Canada, Galt.

PIPE WRENCHES

Borden Canadian Co., Toronto.
Trimont Mfg. Co., Roxbury, Mass.
J. H. Williams Co., Brooklyn, New York.

PNEUMATIC WATER SUPPLY TANKS

Empire Mfg. Co., London and Toronto.
Wm. B. Scaife & Sons Co., Oakmont, Pa.

PORCELAIN WARE

Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
R. MacDougall & Co., Ltd., Galt.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.
United Brass & Lead, Ltd., Toronto.

RADIATOR FOOT RESTS

Beaton & Cadwell Mfg. Co., New Britain. Conn.

RADIATORS

Gurney Foundry Co., Limited, Toronto.
Lord & Burnham Co., Ltd., Toronto.
Steel & Radiation, Ltd., Toronto.
Warden King Ltd., Montreal.

RADIATOR TRAPS (STEAM)

Canadian H. W. Johns-Manville Co., Toronto.
C. A. Dunham Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

RANGE BOILERS

Wm. B. Scaife & Sons Co., Oakmont, Pa.
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REDUCING PRESSURE VALVES

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H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
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ROOF FLANGES AND FLASHINGS

Canada Metal Co., Ltd., Toronto.
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RUBBER GOODS

Canadian Consolidated Rubber Co., Ltd., Montreal.

SEPTIC TANK VALVES AND SYPHONS

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H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
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SHIRTS, WORKING

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Consumers Metal Co., Ltd.

STEAM SPECIALTIES

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Empire Mfg. Co., Ltd., London and Toronto.
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United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

STEAM TRAPS

C. A. Dunham Co., Ltd., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

STOVES

Gurney Foundry Co., Limited, Toronto.

STOVES, GAS AND COAL

Gurney Foundry Co., Ltd., Toronto.

SMOKE TEST MACHINES

James Morrison Brass Mfg. Co., Toronto.

TANKS, STEEL

Wm. B. Scaife & Sons Co., Oakmont, Pa.
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James Morrison Brass Mfg. Co., Toronto.

TOOLS

Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
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Trimont Mfg. Co., Roxbury, Mass.
Williams, J. H., & Co., Brooklyn, N.Y.

UNIONS

Canada Metal Co., Ltd., Toronto.
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VAPOR HEATING SYSTEMS

C. A. Dunham Co., Ltd., Toronto.

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C. A. Dunham Co., Ltd., Toronto.

WATER SUPPLY TANKS

Wm. B. Scaife & Sons Co., Oakmont, Pa.
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WATER SUPPLY SYSTEMS

Empire Mfg. Co., London and Toronto.
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Gurney Foundry Co., Limited, Toronto.

MR. "LICENSED PLUMBER"

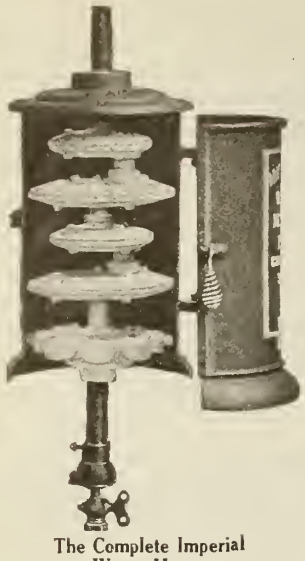
OF TORONTO

Bulletin No. 3

Gas is Toronto's *"DEPENDABLE"* fuel besides being clean and economical. Earn the good-will of your clients by advising them to pipe all buildings for gas.

THE CONSUMERS' GAS COMPANY OF TORONTO

Building Service Bureau - Adelaide 2180

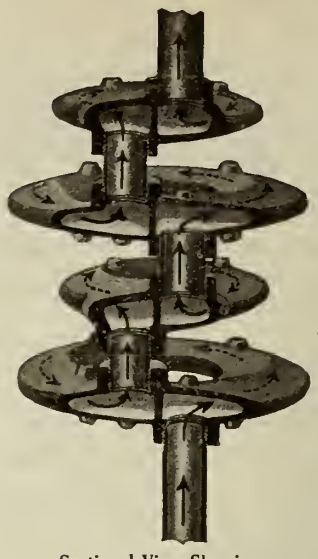


The Complete Imperial Water Heater

BY installing "IMPERIAL" heaters, you serve your customers' interests, as well as your own.

"IMPERIAL" heaters, are made in three sizes, for the ordinary, heavier, or heaviest requirements.

PERFECT HEAT baffling. Absolute water CIRCULATION.



Sectional View Showing Water Flow

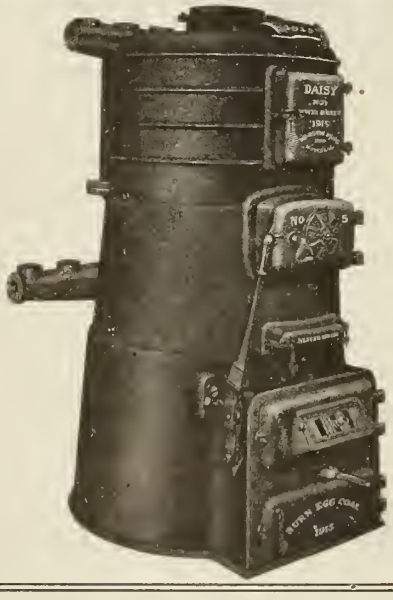
POWERFUL. ECONOMICAL.

For either ARTIFICIAL or NATURAL Gas.

IMPERIAL CITY HEATERS, LIMITED

SARNIA, CAN.

Over 60,000 Daisy Hot Water Boilers Now in Use Are *You* Selling Your Share?



Daisy Hot Water Boilers are easiest to sell because they have an established reputation for exactly meeting the requirements of the modern home.

Every Daisy you instal will help build bigger business by bringing repeat orders for installation in neighboring homes later.

WARDEN KING, Limited, Montreal

BRANCH OFFICE: 136 SIMCOE ST., TORONTO

Pipe Fittings

Made in Canada

The Brand that has the Quality

M Brand Pipe Fittings, etc., give a service and satisfaction that will invariably get you re-orders and much new business as well.

A trial of the goods will prove this claim.

CAST IRON FITTINGS

With this brand mean fittings made with iron of high tensile strength—proper proportions and correct tappings.

RECESSED DRAINAGE FITTINGS

MALLEABLE FITTINGS

With this brand mean fittings made of Air Furnace Refined Iron, reamed and tapped to gauge with perfect threads

Standard and Extra Heavy Flanged Fittings and Flanges. Galvanizing Malleable and Gray Iron Castings of all Kinds.

International Malleable Iron Co., Limited, Guelph, Ontario, Canada

Why Jenkins Bros'. Valves Are Superior

Fig. 106

They are the original renewable Disc Valves. They have more imitators than all other makes of valves combined. They have kept pace with increasing steam pressures and severe working conditions. They are of the simplest design, and can be easily repaired by any man of ordinary intelligence. They are made interchangeable in every part, and any part can be duplicated promptly and inexpensively by the dealer. In the majority of cases they can be repaired by merely changing the disc without the laborious task of regrinding.

Fig. 108

Fig. 114

They are recognized as the Standard Steam Valves in all parts of the World, and wherever there are supply houses—Jenkins Bros'. Valves will be found. The Standard of quality never changes except to improve, and while to-day there are hundreds of imitators, the sales of genuine Jenkins Bros'. Valves are constantly increasing.

Catalogue No. 8 sent free on request.

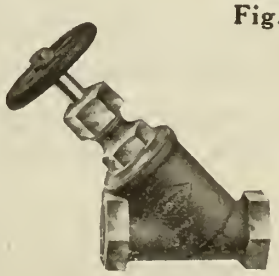


Fig. 124

HEAD OFFICE AND WORKS:
103 St. Remi St.
Montreal, Canada

JENKINS BROS.
LIMITED
Agencies in all the Principal Countries of the World

EUROPEAN BRANCH:
6 Great Queen Street
Kingsway, London, W.C. 2
England

Steel Tanks for Every Purpose

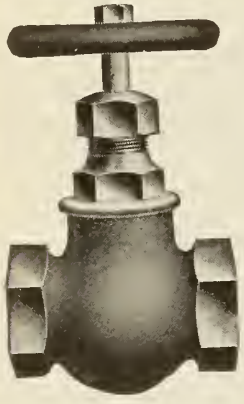
A FEW "SCAIFE" SPECIALTIES:

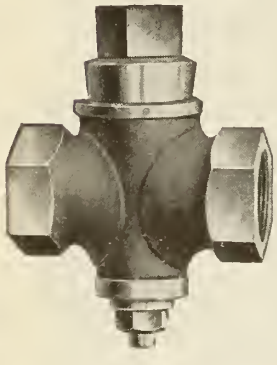
Air Receivers
Boilers—Hot Water
Expansion Tanks
Filters (water)
Hot Water Tanks
Hydro-Pneumatic Tanks
Range Boilers
Tanks (steel)
Water Supply Tanks

117 years old Founded 1802

WM. B. SCAIFE & SONS CO.

New York, N.Y. Office: 26 Cortland St. Home Office: Pittsburgh, Pa.





FIVE WORKS---OVER 3,000 EMPLOYEES

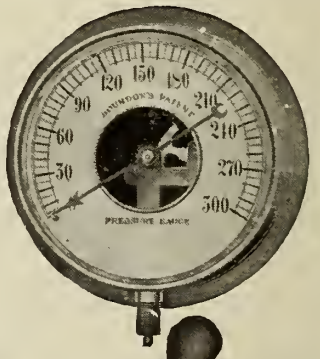
UNITED BRASSFOUNDERS AND ENGINEERS, LIMITED

EMPRESS FOUNDRY, CORNBROOK, MANCHESTER, ENG.

DURING THE WAR our Plants have been exclusively engaged on work of supreme national importance.

WITH PEACE IN SIGHT we are pleased to announce that we intend to again direct our energies to the intensive production of:—

GUNMETAL and BRASS VALVES and COCKS.
STEAM, WATER and COMPRESSED AIR FITTINGS GENERALLY.
CAST IRON STOP and SLUICE VALVES.
SEMI-ROTARY PUMPS.
EXTRUDED BRASS and BRONZE BARS.
BRASS BOLTS and NUTS, STUDS and GENERAL TURNED WORK FROM THE BAR.
CAST AND MALLEABLE IRON COCKS and PIPE FITTINGS.
PRESSURE and VACUUM GAUGES.
INJECTORS and GENERAL JET APPLIANCES.
ENGINE GOVERNORS (Pickering, Proell, and Other Types).
SPRAYING MACHINES, for Insecticides and Lime-washing.
COPPERSMITHS' WORK.
"STELLA" BRAND ALLOYS: MANGANESE COPPER, SILICON COPPER, FERRO ZINC, PHOSPHOR COPPER and TIN, etc.



"UBEL" POST-WAR SERVICE

If you are interested in any or all of the lines mentioned, and are in a position to take a hand in the energetic distribution of the same, please communicate with us NOW to our Head Office, at above address.

WROUGHT PIPE

BLACK and GALVANIZED SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

All Sizes of NIPPLES (Black and Galvanized)

Ask your jobber for CT *Brand of Wrought Pipe*

CANADIAN TUBE & IRON CO., LIMITED, MONTREAL

Works: Lachine, Can.

ADVERTISING INDEX

Amherst Foundry Co.....Inside Front Cover
A. & J. Mfg. Co..... 48
Anthes Foundry, Ltd..... 37
Beaton & Cadwell..... 47
Beaton & Corbin..... 48
Borden Canadian Co..... 48
Bottum Valve Co..... 46
Can. Consolidated Rubber Co..... 3
Canada Metal 9
Canadian Tube & Iron Co..... 42
Canadian Wolverine Co..... 45
Chamberlain Desolvo Co..... 45
Commercial India Rubber Co., Ltd..... 47
Consumers Gas Co..... 39
Consumers Gas Co..... 48
Dunham, C. A..... 3
Empire Manufacturing Co...Outside Ft. Cover
Galt Brass Co.....Back Cover and 11
Gummer, G. & W. G., Ltd..... 1
Gurney Foundry Co..... 47
Hall, J. H..... 47
Hause Mfg. Co., Chas. F..... 48
Hoyt Metal Co..... 44
Imperial City Heaters..... 40
International Malleable Iron Co..... 41
Jardine, A. B. & Co..... 4
Jenkins Bros..... 41
Kerr Eng. Co., Ltd.....Inside Back Cover
Katie Foundry Co..... 44
Long, R. G., & Co..... 45
MacDougall & Co., R..... 47
McIntyre & Taylor, Ltd..... 46
Modern Heating and Engineering..... 4
Lord & Burnham..... 2
Moline Heat..... 7
Morrison Brass Mfg. Co., Ltd., Jas. 37
Mueller Mfg. Co., H. 35
Port Hope Sanitary Mfg. Co. 12
Scaife, W. B., & Sons Co. 42
Steel & Radiation, Limited 6
Standard Sanitary Mfg. Co. 5
Trimont Manufacturing Co. 46
Toronto Hardware Mfg. Co. 47
United Brass Founders & Engineers, Ltd.. 42
United Brass & Lead, Limited 44
Warden-King, Ltd. 41
Wallaceburg Brass Co. 43
Wells Bros. of Can., Limited .....
Inside Back Cover
Williams, J. H., & Co. 6

Quaturn Basin Cocks

Tell us to send you just one pair of these.
Then fit them up on a Lavatory Basin.
Show them to your customers and explain
—the sensible interior construction,
—how they close with the pressure,
—wear all on renewable parts,
—heavily nickelled finish,
—graceful design.
Then—orders.

Your first pair is ready.

The WALLACEBURG BRASS & IRON MANUFACTURING COMPANY, Limited

WALLACEBURG, ONT.

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10 Wellington St. E. Phone: Main 2355
Mr. L. N. Vanstone

Winnipeg
Galt Building Phone: Garry 3389
Moncrieff & Endress, Ltd.

Montreal
358 Beaver Hall Sq. Phone: Main 7531
J. R. Devereux & Co.

The Trade K—T Mark FOUNDRY GALT ONT.

K-T

STANDARD

Soil Pipes and Fittings are of pleasing design and good finish. They look good and they **are good**

SPECIALS

Range Boiler Stands are adjustable to 30-35-40 gallon boilers, and you can connect dirrectly under the boiler. Inexpensive but flawless.

Your jobber can supply our goods--if you ask for them

Plumbers' "NATIONAL" QUALITY *Supplies*

Lead Traps — Lead Pipe

Brass Goods

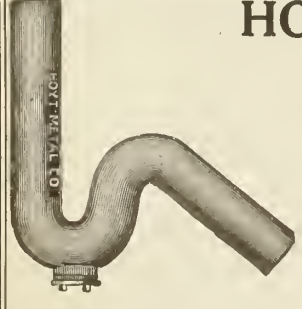
Closet Combinations

Enameled Ware — Boilers — Pipe — Fittings

UNITED BRASS & LEAD LIMITED

TORONTO, CANADA

Write for a copy of our new Catalogue



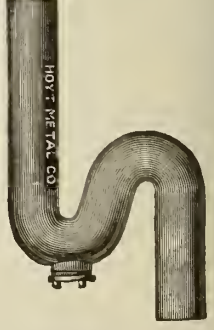
HOYT METAL GOODS ARE KNOWN

FROM COAST TO COAST

As time-savers there are none equal to our Wiping Solder, Bar or Wire Solder.

Hoyt Lead Traps, bends and waste pipe are in a class by themselves.

All our products are made to formula.



Our Mixed Metal Sales Amount To Over $5,000,000 Annually.

Write your Jobber

HOYT METAL COMPANY, TORONTO, ONTARIO

New York, N. Y., London, Eng., St. Louis, Mo.

Write Us

Wolverine
Pipe Joint Cement
FOR
Steam, Water, Oil or Gas

Makes Perfect Non-Leaking Joints

No Waste Simply mix required amount

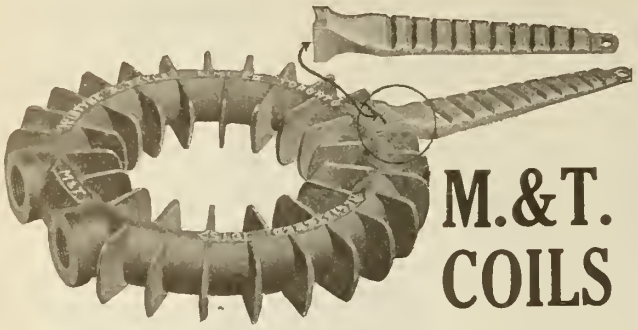
See Catalog "C"

"A Little goes far"

Canadian Wolverine Co., Ltd.
Chatham, Ontario

No Waste Circulation

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER OF CANADA was established in 1907. The subscribers represent the most progressive members of the sanitary plumbing and heating trade in Canada. The paper is issued twice monthly, on the first and fifteenth of the month. Circulates in all Provinces of Canada as well as Newfoundland. There is no waste circulation on SANITARY ENGINEER, because subscribers buy the paper for business. The advertising pages are read closely by the largest buyers of sanitary and heating goods in Canada. These men buy for business as well as for private consumption and, therefore, represent the best class of readers. When you advertise in the SANITARY ENGINEER you are assured of an attentive audience, who are looking for information about your goods and your methods of doing business. Cost of advertising is very moderate, indeed, and we will gladly supply detailed information regarding rates and circulation.



M.&T. COILS

FOR domestic installations a light, compact coil is required and is easily installed. It will do all the work expected of it.

Our No. 15 Boiler Coil fills all these requirements and is only 13 inches in extreme diameter. It has a large heating surface which allows the maximum of efficiency and added to that it will be very durable.

Ask your jobber, or write us direct. We can ship on short notice from stock.

McIntyre & Taylor LIMITED

TORONTO
501-3 Queen St. W.

MONTREAL
55 St. Francis-Xavier St.

WINNIPEG
156 Lombard Street

The Wrench of 25% Greater Efficiency

TRIMO PIPE WRENCH

Two new features have been recently added to the Trimo Pipe Wrench, namely Nut-Guards, in all sizes, and unbreakable steel frames, in leading sizes.

The Nut-Guards prevent the accidental rotation of the nut while in use.

These improvements add 25% to the usefulness of the tool.

The Trimo Pipe Wrench is made with wood handles in 4 sizes, 6-in., 8-in., 10-in., 14-in. and in steel handles in all sizes, 6-in. to 48-in. inclusive.

All Trimo Pipe Wrench parts are interchangeable.

The inserted jaw in the handle can be readily replaced when worn, thus adding to the life of the tool.

Nut with Nut-Guards

Inquiries from Importers and Dealers Solicited. Send for Catalogue No. 55.

TRIMONT MANUFACTURING CO.

Cable Address: Triwrench
Code: Western Union

Roxbury (Boston) Mass., U.S.A.

The Heart of the BV Vapour System

The BV Vapour Regulator will lift 25 lbs. on one ounce of pressure.

Territory for Sales Representatives

The BV Air Eliminator

Bottum Valve Company

213 W. Schiller Street,
CHICAGO, ILL.

Once "Desolvo" Always "Desolvo"

Have you ever received a hurry-up call —a case of a blocked drain? Of course you have. Every plumber has. That is when Desolvo saves you time and lets you out of a dirty job. Desolvo and cold water, that is all—but it does the job on record time and you leave a satisfied customer. That is what Desolvo is doing every day.

If your jobber cannot supply you, write us direct.

The Chamberlain Desolvo Co.

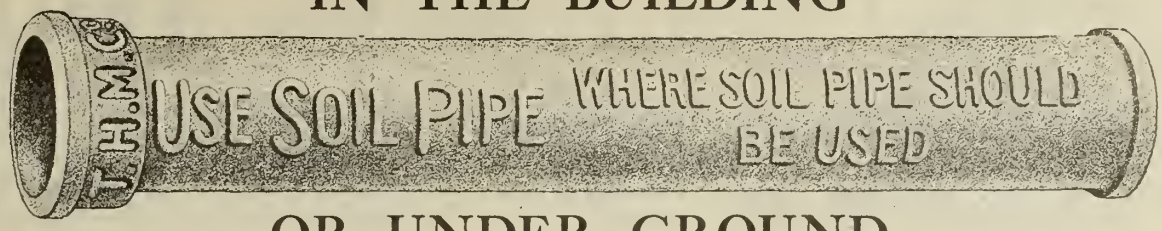
Limited

110 Church St., Toronto

Eastern Canada Representatives:
Richardson & Bureau
55 St Francis-Xavier St.
Montreal, Quebec

General Offices:
Pittsburg, Pa.

IN THE BUILDING



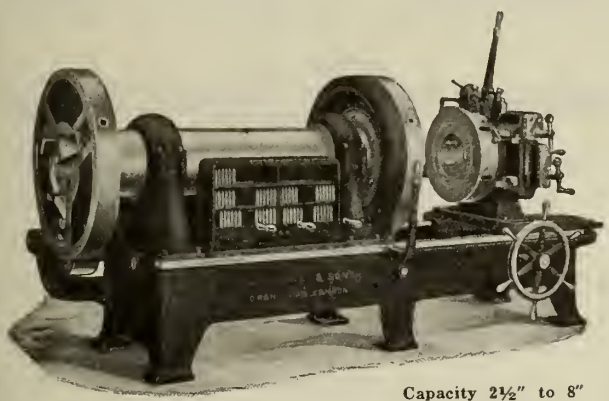
OR UNDER GROUND

ASK YOUR JOBBER FOR T.H.M. CO. BRAND OF SOIL PIPE AND FITTINGS.

TORONTO HARDWARE MFG. COMPANY, - Toronto, Canada

WE MANUFACTURE A FULL LINE OF HIGH-GRADE RANGE BOILERS

Pipe Machines of Merit



Capacity 2½" to 8"

THE HALL No. 8

Duplex Improved Gear Box Driven. Capacity 2½ in. to 8 in. inclusive

Note the drive belt at rear out of operator's way. Elevated die cabinet, control lever and speed levers all convenient to operator's right hand. Sliding die head.

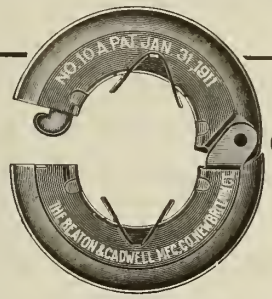
These machines are equipped with a friction clutch, enabling operator to revolve pipe a few inches, if necessary.

Pipe Machines ranging from ⅛ to 18".
Nipple Machines ranging from ⅛ to 4".
Roller Pipe Cutters ranging from ⅛ to 4".

Delivery from stock.

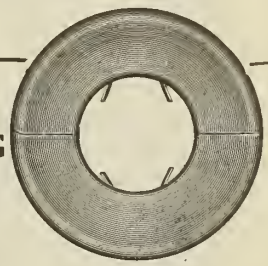
Write us for full particulars and prices.

John H. Hall & Sons, Ltd., Brantford, Can.



OPEN VIEW
NO. 10-A

The CEILING PLATE that's better



TOP VIEW
NO. 10-A

THE NO. 10—A NARROW FLANGE PLATE—IS A STEEL HINGED PLATE. FLANGES ¾" WIDE. HIGHLY FINISHED. ESPECIALLY DESIGNED FOR TWIN CONNECTION "NARROW."

Gem No. 4.

The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

High quality at the right price.

Gem No. 4 Automatic Air Valve

Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

Write for catalog showing our complete line of specialties.

The BEATON & CADWELL MANUFACTURING Co.

New Britain, Conn.

Eastern Agent: J. R. Devereux & Co., 358 Beaver Hall Square, Montreal. Western Agent: A. E. Hinds & Co., Chamber of Commerce, Winnipeg.

"VALVENE" Discs (REGISTERED)

Specially prepared for Hot and Cold Water Taps. All sizes from ½ inch to 1½ inches. Soft, Pliable, and "Joint-Perfect."

Price List and Samples on Application.

THE COMMERCIAL INDIA RUBBER MANUFACTURING & SUPPLY CO., LIMITED

SOLE MANUFACTURERS 585 Commercial Road, LONDON, E.1.

GURNEY-OXFORD BOILERS RADIATORS

FOR HEATING ANY DESCRIPTION OF BUILDING BY STEAM OR HOT WATER

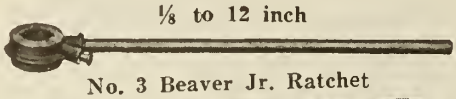
THE GURNEY FOUNDRY Co. LIMITED

TORONTO MONTREAL CALGARY WINNIPEG VANCOUVER

BEAVER TOOLS

For Easy Cutting

⅛ to 12 inch



No. 3 Beaver Jr. Ratchet

THE pipe-threading problem is readily solved when **Beaver Easy-Working Die Stocks** are used. They cut quicker and save labor, time and money.

They eliminate troublesome bushings and the bother of changing dies.

Beaver Threaders are easily adjusted. Simply "move the handle—that's all."

Beaver Tools are absolutely guaranteed. The user and the dealer are both protected.

Write us for descriptive circular and prices.

The Borden Canadian Company

110 Church St. - - - Toronto, Canada

SAVE YOUR COUPLINGS

Write us what you have of the various sizes, either in pieces or pounds, and we will make you a cash price on them.

The A. & J. Mfg. Company

559 West Lake St. Chicago, Ill.

GENUINE

ARMSTRONG STOCKS and DIES

Hingd Pipe Vises *Pipe Cutters*

Pipe Threading Machines

—MANUFACTURED BY—

THE ARMSTRONG MFG. Company

317 Knowlton Street BRIDGEPORT, CONN

248 Canal Street NEW YORK

Second-Hand Pipe

1-2" to 4"

Black and Galvanized

Send us list of your requirements

Consumers Metal Company, Limited

14 St. John Street MONTREAL

Works: LACHINE, QUE.

No. 1 B. & C. Automatic Radiator Air Valve

Made from the best brass with cast brass base. Screwed and soldered on, and equipped with high grade carbon. All valves tested before shipping. Use these together with our famous "B & C" Floor and Ceiling Plates and insure satisfaction.

The Beaton & Corbin Mfg. Co.

Southington, Conn.

Stocks carried by our Canadian Representatives

Canadian Representative: W. H. Cunningham & Co

183 Church Street - - Toronto, Ontario

Chas. F. Hause Mfg. CLo., td.

Manufacturers

Iron Pipe Joint Cement

SETS LIKE GUM
ALLOWS NO LEAKS

Liquid and Powder Form.

Packed in 1-lb., 5-lb., 15-lb., 25-lb., 50-lb. cans; 100 and 250-lb. barrels. Ask your jobber for prices or write us direct.

Made in Omaha, Neb., U.S.A.

Canadian Distributors:

EMPIRE MANUFACTURING CO., LIMITED

LONDON AND TORONTO

WORTH WHILE PUBLICITY

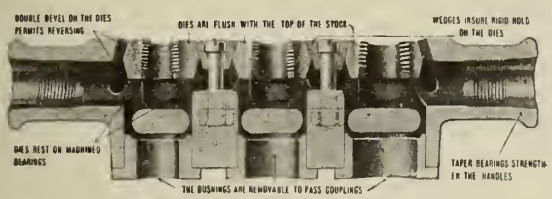
The general tendency in Canada is towards selling high-grade goods. There never was a time, in the history of the country, when all branches of the Canadian trade were more interested in securing all possible information regarding products they can recommend and guarantee to their customers. Advertisers in SANITARY ENGINEER reach the cream of the trade in all parts of the Dominion.

For Easy Pipe Threading
TRY THE TRIO

Simple — Compact — Complete

3 Dies in 1 Stock

The TRIO uses Little Giant Pipe Dies with the patented double bevel which permits reversing---carries the three sizes you use most frequently. TRIO is fully adjustable.


DOUBLE BEVEL ON THE DIES PERMITS REVERSING
DIES ARE FLUSH WITH THE TOP OF THE STOCK
WEDGES INSURE RIGID HOLD ON THE DIES
DIES REST ON MACHINED BEARINGS
TAPER BEARINGS STRENGTHEN THE HANDLES
THE BUSHINGS ARE REMOVABLE TO PASS COUPLINGS

Always Ready --- Always Right
Ask for Catalogue

Wells Bros. Company
of Canada, Ltd., Galt, Ontario

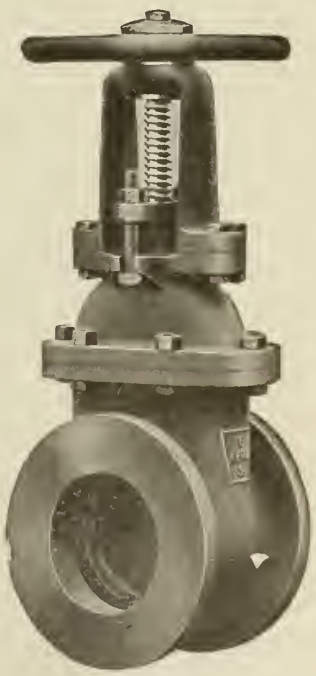
Canadian factory of the Greenfield Tap and Die Corporation

There Are Lots of Gate Valves

Advertised and Sold

but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.
Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.
Approved by the Fire Underwriters' Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

The VITRO Tank

Conclusive evidence that tank troubles are over is given by the VitrO. VitrO tanks installed over ten years ago are still in use and are working as well as the day they were new. Not the first sign of a leak. This is a record we are proud of. The VitrO, the tank without a lining.

The VitrO is built entirely in one piece. No joints to open. No lining to leak.

The VitrO is neat in appearance, silent in operation and simple in mechanism. It does not need repairs.

OUR GUARANTEE

A new tank will be given to replace one that at any time proves defective from either material or defective workmanship.

You should have our **VITRO catalogue.** Write for it. It's FREE.

EVERY FITTING TESTED

GALT BRASS COMPANY
Limited
GALT - ONTARIO

EVERY TANK GUARANTEED

Sanitary Engineer

Plumber and Steamfitter of Canada

VOL XIII. PUBLICATION OFFICE, TORONTO, JUNE 15, 1919 No. 12

The "EMCO" Valve

Has Nine Points of Superiority

Registered in the following provinces as follows:

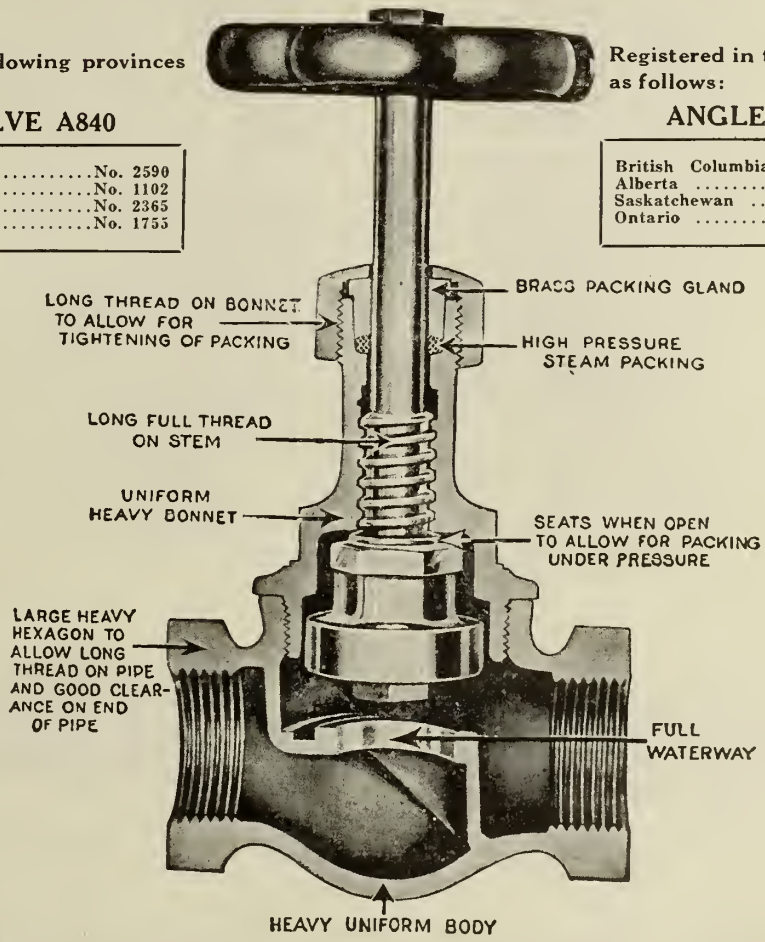
GLOBE VALVE A840

British Columbia	No. 2590
Alberta	No. 1102
Saskatchewan	No. 2365
Ontario	No. 1755

Registered in the following provinces as follows:

ANGLE VALVE A842

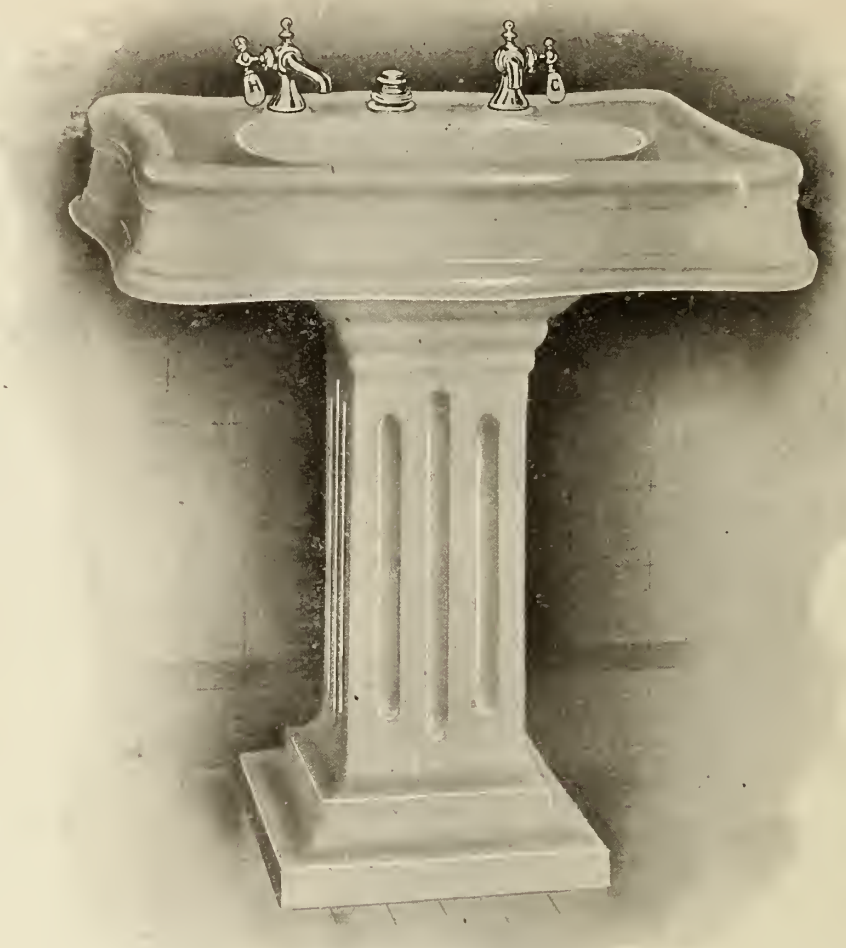
British Columbia	No. 2592
Alberta	No. 1105
Saskatchewan	No. 2377
Ontario	No. 1775


LONG THREAD ON BONNET TO ALLOW FOR TIGHTENING OF PACKING
BRASS PACKING GLAND
HIGH PRESSURE STEAM PACKING
LONG FULL THREAD ON STEM
UNIFORM HEAVY BONNET
SEATS WHEN OPEN TO ALLOW FOR PACKING UNDER PRESSURE
LARGE HEAVY HEXAGON TO ALLOW LONG THREAD ON PIPE AND GOOD CLEARANCE ON END OF PIPE
FULL WATERWAY
HEAVY UNIFORM BODY

EMPIRE MANUFACTURING CO., LIMITED

LONDON AND TORONTO, CANADA

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While



A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for BEAVER BRAND CAST IRON ENAMEL WARE

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

ONTARIO:
Monarch Brass Mfg. Co., 71 Brown St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes, 120 Lombard St., Winnipeg

"STERLING"

HACK SAW BLADES

The cut on this page represents a Hack Saw Blade particularly adapted for the use of plumbers and steamfitters. These blades have 24 and 32 teeth to each inch. The teeth are of peculiar construction and do rapid and accurate work, standing up under the heaviest kind of treatment.

The fine teeth blades under the brand of "STERLING" are really in a class by themselves for plumbers and gasfitters, also electrical workers, for cutting pipe, conduits and sheet metal of all kinds and gauges.

These blades are manufactured in the all hard, also with the soft back, teeth only being hardened.

Ask your dealer for them.

Manufactured by

DIAMOND SAW & STAMPING WORKS

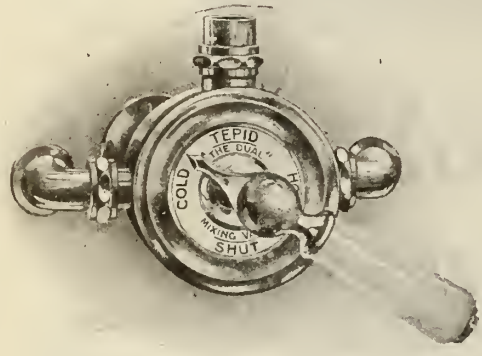
BUFFALO, N.Y., U.S.A.

SANITARY ENGINEER, June 15th, 1919. Published the 1st and 15th of each month at 143-153 University Ave., Toronto, Canada, by the MacLean Publishing Co., Ltd. Vol. XIII., No. 12. Yearly subscription rates: Canada, $1.00; United States, $1.50; Great Britain and the Colonies, 4s. 6d.; elsewhere, $2.00. Entered as second-class matter at the Post Office Department, Ottawa. Entered as second-class matter July 1st, 1912, at the Post Office at Buffalo under the Act of March,, 1897.

G. & W. G. GUMMER, LIMITED

EFFINGHAM BRASS WORKS, ROTHERHAM, ENGLAND

And at
9 Fenchurch St.,
London



"Dual" Mixer

A valve that really mixes Hot and Cold Water, and maintains a uniform mixture.

For ease of operation, simple construction and easy installation, it has set a new standard of efficiency.

Cold Water must be turned on first, no possibility of scalding.

Made in several forms for Showers, Sprays, Operating Rooms, etc.

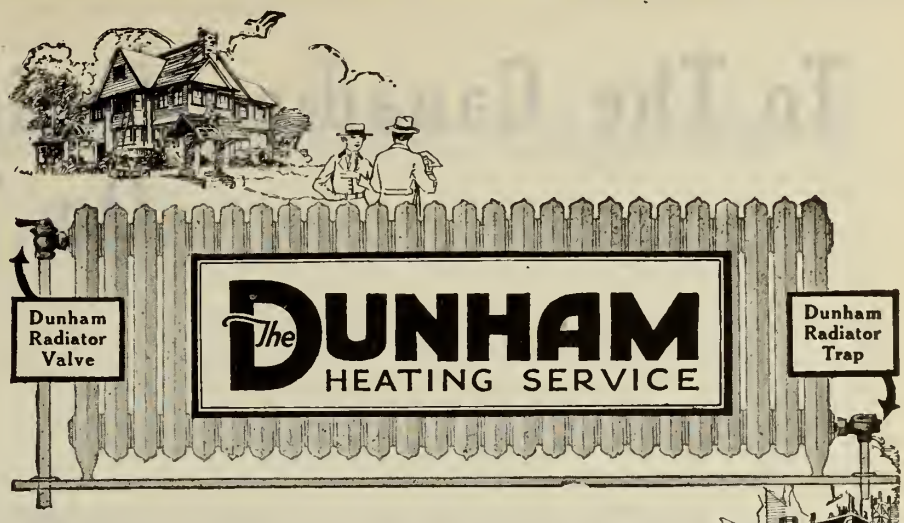
At the well-known works of Messrs. Brunner, Mond & Co. these valves provide baths for 2,500 employees.

G. & W. G. GUMMER, LIMITED

Manufacturers of every description of

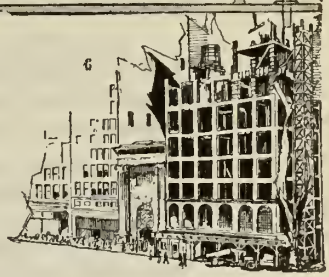
Engineers,' Plumbers' and Sanitary Quality Brassware

Let Us Help You



WHEN you are figuring your next heating contract make use of Dunham Heating Service. Remember, the public demands better and more efficient heating. It expects the maximum comfort at a minimum use of fuel.

What was considered first-class a few years ago is now considerably out of date. Dunham Heating is the most efficient and up-to-date method of heating. Anyone using or installing heating equipment should learn more about Dunham Heating Service. It is the product of 15 years specialized experience in heating. Write us for full information if you are interested in better heating. We will be only too pleased to help you in any way.



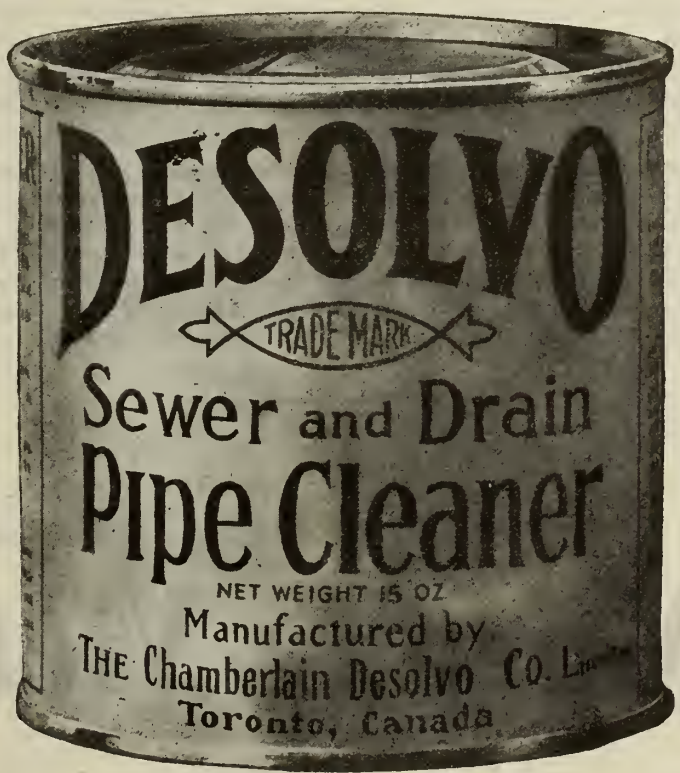
C. A. DUNHAM COMPANY, LTD., TORONTO, ONT.

Halifax Ottawa Winnipeg Vancouver Calgary Montreal

Give It

IF you have not tried Desolvo, you are not aware of the results you can procure when you have to clear blocked waste pipes. It is really wonderful.

We have had 10 years' experience in the chemical manufacturing industry, and we guarantee results if instructions are carried out.



A Trial

SOME of the largest concerns in Canada will vouch for the sterling worth of Desolvo. It saves time and accomplishes better results than any pipe cleanser on the market.

Desolvo mixes with cold water and generates a very high temperature; it will thaw out frozen rain water leaders, frozen drains and soil pipe stacks, without injuring the pipes or plumbing fixtures. It is handled by almost every jobber in Canada.

THE CHAMBERLAIN DESOLVO COMPANY, LIMITED

General Offices, Pittsburgh, Pa. 110 Church Street, Toronto, Canada

Eastern Canada Representatives: Richardson & Bureau, 55 St. Francis Xavier St., Montreal, Quebec

To The Canadian Society of Domes
On Their 22nd A
Gree

Gentlemen:—

I feel that I would be doing an injustice to the trade and to the public in general, if I, as president and managing director of the Murphy Victory Furnace Co., Ltd., allowed this opportunity to pass without bringing to your notice an important matter, connected with hot water heating.

I would like to explain as briefly as possible, an altogether new design of the Victory Hot Water Heater.

This Heater is designed for the heating of homes. It is intended to be placed in the most convenient place—the kitchen—where father or child, or even mother, can conveniently attend to the fire.

The Victory Hot Water Heater will:

Heat the room where it is installed,
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The fire pot is constructed into three compartments, each of which can be fired separately.

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Our new heater is designed for real home comfort. It saves the radiator in the kitchen, can be connected to the radiator in the other rooms, with pipe and fittings, one quarter the size used for ordinary furnaces, and will give better results. It will keep the air in the house pure for the reason that every cubic foot of air which passes through the furnace into the smoke chimney must be replaced with pure air from outside, and when we take into account the great volume of air required to consume coal, we must conclude that we have sufficient ventilation.

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tic Sanitary and Heating Engineers
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Provision is also made for humidity, for cooking naturally produces it, and if cooking is not being done a pan, pot or kettle of water may be placed on the fire holes of the heater, which will produce a continuous supply of humidity.

Now, Gentlemen, when we consider that the mother who must spend practically 24 hours of the day in the home, and almost half of that time in the kitchen, and when we know that the child, which is the mother, or the father of the next generation, is with the mother practically all of its time, you can readily understand how important it is to keep the air warm, pure and clear in the room where mother and child spend so much of their time.

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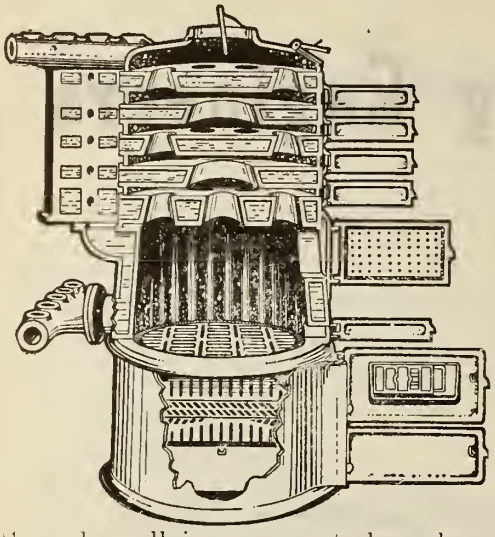

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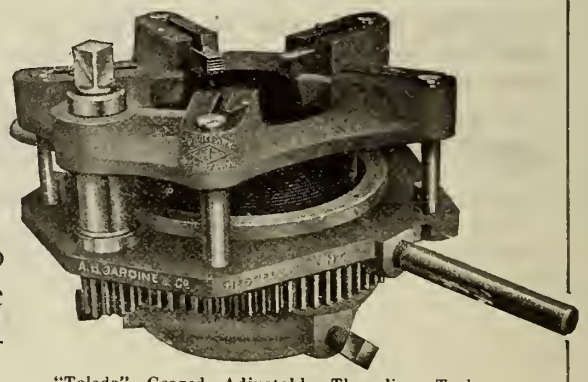

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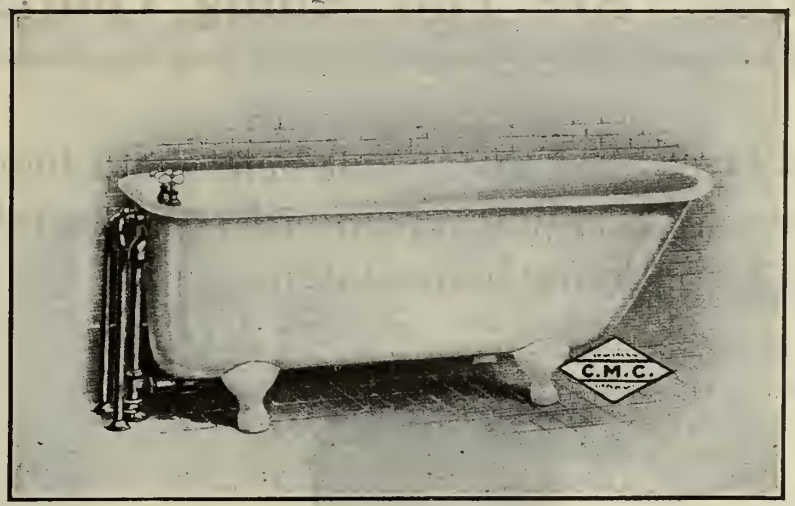

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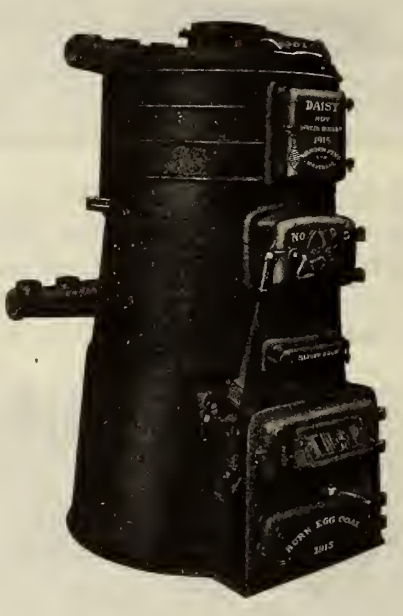

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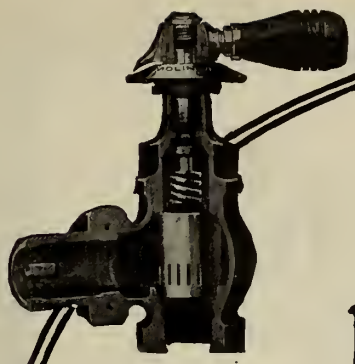

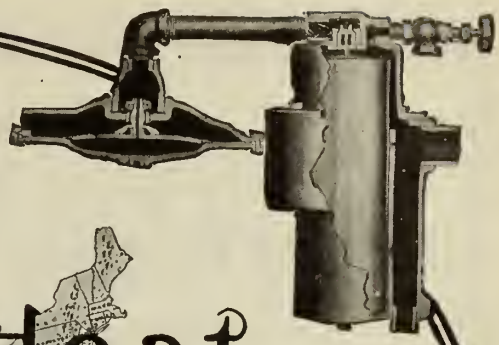

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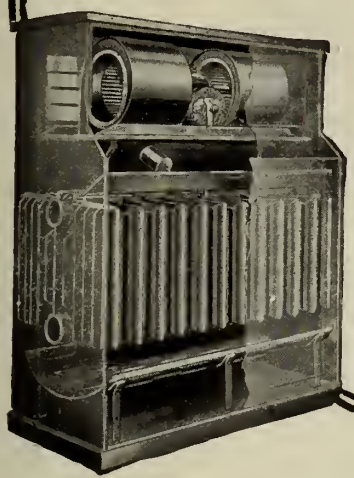

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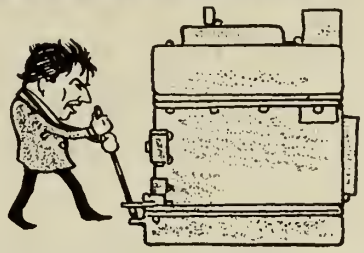

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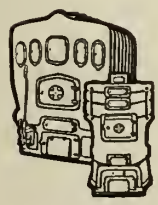
IT'S just plain human nature for a man to get so stirred up over a grate, that he has to lug and tug on to shake, that he unconsciously, or otherwise, leaves the pit choked full of ashes, and if the drafts are left open long enough, the grate burns out.

So that's one of the reasons why we make Burnham Boiler grates shake half at a time, because then they shake half again easier.

Another thing in favor of half the grate shaking at a time you can run half the fire at a time.

Clinker doors are mostly cramped narrow slits. The Burnham has a wide-mouthed one—big enough to do what it's meant to do.

Burnham Boilers



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SANITARY ENGINEER

PLUMBER AND STEAMFITTER OF CANADA

ESTABLISHED 1907 PUBLISHED TWICE MONTHLY

Vol. XIII. JUNE 15, 1919 No. 12

CONTENTS

Dominion Convention a Great Success	15-19
Reports From C.S.D. and H.E. Officers	20-23
Provincial Vice-Presidents Send Reports	24-26
Committees Review the Year's Work	26-28
Recommendations and Comments by Resolutions Committee on Various Reports	28-29
Credential List and Delegates	29
Manufacturers' Representatives and Supply Men Introduced	29
Editorial Comment	30
Modern Vacuum, Gravity and Home Steam Heating	31-34
Features of Future Issues	34
Current Events in Photograph	35
Predicts Farm Work Will Maintain Small Town Plumber	35
News From Here and There	36-37
How to Figure a Seven-piece Job	38
Heating and Ventilating—Details	39-41
Ventilating the Modern School	40-41
Market Conditions and Tendencies	42-44

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THE PLUMBER'S SPHERE OF INFLUENCE

Two men interested in the plumbing business were discussing the Master Plumber and his opportunities.

The first asserted that there is a good field for the Master Plumber who establishes himself in a good neighborhood, keeps inviting premises, has an attractive display of plumbing fixtures and model bath-rooms, together with side lines consisting of gas and electric ranges, electric fixtures, vacuum cleaners, small motors and other electric equipment.

Such a plumber, in his opinion, would soon develop into a merchant and be able to serve the community well. He could give good attention to the transient trade which would be attracted by his display, and would also be able to take care of the requirements of his regular customers.

The second said "NO," that the Master Plumber will serve himself and the community best by making a careful survey of the field in which he can best operate: by getting acquainted with his prospective customers, studying their requirements and making them interested in either the replacement of the old and worn-out plumbing, or by installing complete new outfits.

If he carried on business in that way he would be able to give his customers good advice, would have the advantage of being on the spot, noting the kind of fixtures which would best suit the position in which they were to be installed, could give an intelligent price on the work, could close the job at once through his personal interest, see that it was perfectly installed and would make a satisfied customer. He would be a real salesman inasmuch as he introduced the subject, made the proposition attractive, and closed the business.

The conversation did not end here, but the two opinions are presented as they furnish a subject for consideration, and could be profitably discussed at the meetings of the Master Plumbers' Association and through the columns of the plumbers' trade paper.

The writer does not venture an opinion further than to say that if every one of the twenty-five hundred reputable Master Plumbers in Canada were salesmen under the conditions noted by the second speaker, and devoted their attention to the sale of bath-rooms a ready market would be provided for all the enamelware which the manufacturer could make. The manufacturer is interested because all plumbing material is or should be distributed, through the plumber who does the work of installation. What is good for the manufacturer is good for the plumber, and the manufacturer is well pleased when the plumber enjoys a large and profitable business.

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Sanitary Engineer
Plumber and Steamfitter of Canada

Published First and Fifteenth of Month

Vol. XIII. TORONTO, JUNE 15, 1919 No. 12

Dominion Convention a Great Success

Strong Discussion on Vital Problems Presages Forward Movement—Plumbers as Business Men—Co-operation Between Master and Mechanic—Education of Plumbers and Public—Strong Slate Officers Assures Bright Future — Toronto Next Convention Centre

Written for SANITARY ENGINEER by A. H. ILLSEY, Associate Editor.

THE keynote of the twenty-third annual convention of the Canadian Society of Domestic Sanitary and Heating Engineers, held in Montreal on June 3, 4 and 5, 1919, was that of co-operation and education. In the broadest sense of these terms there is far more than appears upon the surface, and it is safe to affirm that the long experience in the work of the society and in connection with the furtherance of the aims and objects of the provincial and local associations with which they have from time to time been connected, served to bring these features forward in the minds of those suggesting them as the only true and lasting basis upon which a broader, greater, successful Dominion society can continue to operate.

When Montreal sent forth its invitations to members of the craft residing in all parts of its wide and far-flung domain, it said nothing about weather conditions, and in this respect it was wise. But the weather man was on the job in earnest. If actual demonstration was required to convince delegates of his interest in the convention, then indeed, it must be assumed that he took this to be a convention of heating experts only; he supplied an unending, unwavering supply of such torrid atmosphere as few Montreal June months have ever recorded. But, to the credit of the delegates attending be it said, that they faced this condition well—were real stoics indeed, for they continued to burn the midnight oil until the gray dawn found them weary, though unworsted, when they turned in for a few short hours before the opening of subsequent sessions at the Convention Hall.

New Era Dawns

The official opening of the convention, according to schedule, took place on Tuesday afternoon, the 3rd. President Alex. Charette of Montreal, who has graced the presidential chair for the past three years, delivered a message of splendid and timely interest, calling upon members of the craft everywhere to stimulate interest and endeavor. In deference to the dual nature of the gathering, the president's message was delivered in both French and English, and the spirit of it was excellent. Particularly did the president express his gratitude to members of the executive for the co-operation they gave ungrudgingly that this convention might be the success he hoped it would be.

Particular welcome was extended the visiting delegates by J. E. Walsh, the Quebec provincial vice-president, on behalf of his associates. In a forceful, well-directed message, Mr. Walsh left no uncertainty as to the warmth of this welcome, even though the time-honored precedent of an official civic welcome was dispensed with. In this respect the speaker believed that it was best to extend a simple welcome, none the less genuine or sincere, and preserve to the visitors and all assembled the full time of the convention, for discussion of the questions for which they were now assembled. "Every service of the Montreal Association is at your command," he said, and this was borne out subsequently at every turn.

That a new era had dawned for the world, and that this is likewise applicable to the Canadian Society of Domestic Sanitary and Heating Engineers, was the gist of the report brought in by the resolution committee, and which sat early and late, that a real, progressive and worthy report might be recommended the convention as a whole.

Over and over again, members were admonished to get away from the old idea of holding themselves in limited esteem as an integral part of Canadian life. Several speakers reiterated the necessity of discerning their profession as a most important one, having in their hands, so to speak, the health of Canadian citizenship. The sanitary engineers' solemn task, it was pointed out, was that of preserving to citizens generally the most precious of gifts—continued health. It was only by accepting this vital responsibility in the foregoing light that the sanitary engineer could

Officers-Elect C.S.D.S.& H.E.

President—F. R. Maxwell, Toronto.

Vice-Pres. — H. Mahoney, Guelph.

Secretary — Garrett Frankland, Toronto.

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Quebec—H. Lavigueur, Montreal.

P. E. I.—Thos. Johnson, Summerside.

New Brunswick—W. J. Crawford, St. John.

Nova Scotia—Left with Executive.

Manitoba—Left with Executive.

Saskatchewan—N. B. Roantree, Swift Current.

Alberta—James Marr, Calgary.

British Columbia—Left with Executive.

Chairman Sanitary Committee—John Wright, Toronto.

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Legislative—J. T. Blyth, Ottawa.

Essay—E. H. Russell, London.

Apprenticeship—Geo. Clapperton, Toronto.

realize and appreciate his importance in the true economy of Canadian citizenship.

Real Business Men

If there was any doubt as to the type of business man which the modern plumber and steamfitter is destined to be, this vanished before the close of the convention. And for those who may not have possessed a more complete grasp of a costing system, secretary Garrett Frankland's brief, illustrated talk at the close of the convention on "How to Make Money," provided an object lesson that struck right home. It is safe to say that the plumbers and heating engineers present will not tolerate any hit-or-miss estimating, and that there will be progress in this respect which will place this business on a plane quite as high as that pertaining to the modern business of any other business or professional man. And to the extent that this is accomplished, in just such measure will the craft attain success from a financial standpoint.

Vice-President C. R. Myers, of Stratford, suggested working from the close of the convention, keeping in touch with vital matters and then, if necessary, spurting up and putting on more speed later in the year and prior to the next convention. It was a mistake, he said, to let matters rest for many months and expect the best results to be obtained. "We too often look upon the work of the society as a pleasure and not as a matter, rather, of business," said Mr. Myers. And further, he would like to see Dominion, Provincial and local organization effectively carried out.

Vice-Presidents Vital

If the work of the Canadian Plumbers and Steamfitters is to be the greatest success, much responsibility rested upon the provincial vice-presidents, Thos. Maxwell of Toronto, thought. This officer, in Mr. Maxwell's opinion, could exert a great influence for the welfare of his own provincial section, and suggested greater activity upon the part of these officials. "The whole thing centres on organization," added Mr. Maxwell. The vice-presidents could be a mighty force if they would study the various situations and be a leading force for the membership under them.

THE CONVENTION PHOTOGRAPHS

SANITARY ENGINEER, desirous of making the report of the Convention's proceedings bright and attractive, engaged its own photographer to secure first-class photographs of the delegates and officers. It is because of this arrangement that it is possible to give readers far away and elsewhere who were denied the privileges of attending, a comprehensive story, not only of the proceedings but a glimpse into the faces of some of those who "carried on."

Dominion Secretary John Watson believed that many of the Provincial vice-presidents had been active, while others had been a source of disappointment, especially in their failure to answer correspondence. Mr. Watson had written repeatedly, in some cases, and had even then not been able to get response. He believed that it was best to be perfectly frank in denouncing this carelessness, for it was decidedly disappointing when important questions awaited solution. At the same time, Mr. Watson wished to go on record as appreciating the good material that came to light sometimes. It was a matter very often, he said, of a vice-president getting started. Many had eventually made excellent office-bearers.

Co-operation—Organization

Typical of every session, and characterizing some more particularly, were the themes of co-operation and organization, and—inseparable from the latter—education. This was that fine underlying spirit that contributed so largely in making the 1919 convention the decided success it was. The world is changing, the business methods of yesterday will not answer to-day, and for this reason the master plumber and the heating engineer must face the future in the confidence that he is a factor in the making of a new Canada of no small importance.

C. B. Henderson, Brantford, told of the great strides which had been made in connection with the Association of Electrical Contractors, with which he was associated, and believed that their experience would serve to encourage the Master Plumbers and Heating Engineers. In this association the plan of contributing fees for the promotion of their enterprises as an association, was followed. Contribution was made according to one's turnover and the appointment of the assessments so secured were distributed among the National, Provincial, and local organizations. Since this association had done more in two years under competent management for the welfare of the electrical contractors than it would accomplish ordinarily in fifteen, Mr. Henderson said that he would be willing to contribute any reasonable fee to the furtherance of a co-operative scheme among master plumbers and steamfitters. He believed it was good, sound, business policy.

Considerable discussion passed as to whether a proposal to contribute a fixed proportion of one's turnover toward the work of the Dominion association was in the best interests of the trade. Some favored a definite percentage ranging from one per cent. of one's annual turnover to one quarter of one per cent.

Thomas Maxwell, of Toronto, said that he believed an educational campaign was a great thing. It had been a wonderful success in Ontario, with which Provincial association he was connected, and specially successful in the city of Toronto. He favored a levy of, say, one quarter of one per cent. rather than a larger fee.

Another point made by Mr. Maxwell, was that of the advantage that had come to the Toronto association through examinations. This was a point that might illustrate the advantage of co-operation, for examinations were conducted in a very impartial way, contestants not even attaching their name to an examination paper, the same only being numbered. This eliminated all possibility of favoritism being accorded or a grudge being squared by an examiner, who might be prejudiced.

President Clifford Huot, of Quebec City, wanted to see organization in his native Province carried out in relative proportion at least to that of Ontario, as far as possible.

While the matter of definite assessment was not acted upon, the discussion was timely and effective.

"Figures won't lie," said President F. R. Maxwell, of Toronto. "When a plumber begins to get figures he becomes interested," continued Mr. Maxwell, and in the course of a very earnest and effective address spoke of the value of education in Toronto. Through the employment of an ordinary blackboard and chalk, plain, cold figures had induced the membership to see the possibilities of doing work on a business basis.

THE NEW PRESIDENT

To see and meet the new President, F. R. Maxwell, is to readily believe what his closer friends say of him, namely, that he is a worker. "F. R." admits that he can work, and committed himself to a program of progress in 1919, if he is given anything like the support a President should have. Watch her grow, boys!!! If the President-elect has his way—and he will—there'll be some Convention next year and some big attendance. SANITARY ENGINEER *doubts not that the wheels have already begun to hum. Here's great good luck to the President and his fellow-officers.*

THE NEW VICE-PRESIDENT

Harry Mahoncy, Vice-President-elect, comes from Guelph, Ont. The President will surely have no lack of support, for Mr. Mahoncy left no doubts at the Convention of his interest in doin' things, and doin' them well. Mr. Mahoney will be one of those whose efforts will bend strongly toward a large increase of membership.

Mr. Maxwell dwelt upon the value of master plumbers co-operating in getting other masters into the local association and also upon the value of reorganizing the workman and his rights.

A Permanent Secretary

Of the important appointments upon which the future of Dominion success will largely rest, none brought forth wider or more spirited discussion than that of the selection of a permanent, paid secretary. That all realized the importance of this decision was evinced in the care with which the matter was discussed. and it was not until the closing hours of the last session that the question was disposed of, resulting in the selection of Garrett Frankland, of Toronto, who, though saddled with onerous duties for his own Provincial Association, was considered to be well qualified by his long connection with active association work to sense the needs of the Dominion society.

In the various discussions there was a divided expression as to whether a secretary should be chosen whose whole time would be given to the formation of new locals throughout the country. or whether he would exercise more of a supervisory interest. Evident it was, that a suitable man could not be secured to devote his whole time to this work, travelling from coast to coast, and being provided perhaps, with a stenographer and permanent office, without an entailed expense of probably $10,000 per year. With no apparent or definite guarantee as to provision for this amount, it was concluded to not go too far, and the arrangement with the Ontario secretary, Mr. Frankland, seemed to meet with general approval. He will be granted a salary of $500 per annum at present, the new executive devising ways and means of raising the required amount.

In addition to this, Mr. Frankland was selected, amid applause, to represent the society at the big convention being held in Atlantic City in June.

Bulletins—Advertising

There was a general feeling that the work of the society could be greatly aided through the spreading of data from time to time that is of interest to every plumber and steamfitter. In this connection the suggestion of issuing a bulletin was made early in the convention and the matter was given consideration by the special committee on resolutions. There were various ways of issuing this, and the matter of printing a special bulletin, while recommending itself, had drawbacks. Finally it was decided to use the medium of the trade journals for this desired publicity, and representatives of the trade papers present signified their readiness and willingness to assist in publishing all the matter handed them which would be of interest to the trade and for whose benefit they existed. These representatives took occasion to ask that a co-operative attitude be extended in imparting such helpful news as members of the craft would enjoy reading.

E. H. Russell thought that all should secure the bulletin issued by the Federal Government relative to a better understanding on industrial relationships, for the workman of to-day, he said, is entitled to and must be shown consideration. In this Mr. Russell was strongly supported by F. R. Maxwell, and co-operation with builders' exchanges, where possible, was also advised by Mr. Maxwell.

Mr. Delaney, of Montreal, thought there was room for an educational campaign in Quebec, and would advocate a good stiff examination for plumbers. Many troubles, in his opinion, were local in character.

One of the suggestions which E. H. Russell would make to his association in London, he said, was that of using regular space in the local paper to advertise concertedly and collectively. He believed that at least a quarter page space might be taken to good purpose in educating the public as to the advantages of modern sanitation and installations. "We must co-operate with the press," said Mr. Russell, "if we are to attain the best results."

Some Excellent Reports

It was decidedly to be regretted that circumstances prevented representation coming from the distant provinces. Regret was expressed that no delegates attended from the Maritime Provinces. It is doubtful if circumstances will make possible the holding of a Dominion convention in this section of the country soon, and for this reason in particular delegates would have been warmly welcomed.

Reports came to hand from Prince Edward Island, New Brunswick, Saskatchewan and Alberta, and proxies were appointed by the convention to vote for the various provincial associations not represented personally.

The messages received from the various vice-presidents wished the 1919 convention real success and expressed regret that delegations could not be sent. They would look forward with great interest to the full report of proceedings, which they were, for various reasons, prevented from taking part in.

Before the close of the convention a telegram of greetings was received from the Border Cities Plumbers' Association, of Windsor, Ont., and advising that five memberships would be taken out in the Dominion society at once. This was read by the secretary amid applause.

All reports were referred to the resolutions committee and particular attention was drawn to that from the Provincial vice-president of New Brunswick, and upon which comment was made later in the report of the resolutions committee.

Reference was made to the excellent and extended work done by the retiring secretary, John Watson, of Montreal. As a tangible recognition of Mr. Watson's work, he was voted $200, and, contrary to a counter suggestion on his part that this be cut in two, the resolution was made unanimous. In addition, Mr. Watson was made the recipient of a fountain pen by Retiring President Charette. "John Watson has worn out a good many pen nibs in doing the work of this society, and I think it but right he should accept this pen," was the sentiment conveyed by the new president, F. R. Maxwell, speaking for Mr. Charette. To the tune of "Clementine" the whole assembly arose and sang two verses, concluding with "He's a Dandy." Then, as the new president, "F. R.," begged Mr. Watson to accept a huge bouquet. previously presented the new president by Past President Alex.

TORONTO NEXT CONVENTION CITY

The discussion introduced as to the next place of meeting was very brief. Toronto was chosen, and this seemed to accord with the wishes of all. It will possess the advantage of having within its confines, or within close reach, the officers chosen, and this is in definite accord with the expressed desire of some of the speakers who had given the matter consideration. It was practically agreed, once the recommendation was made by the committee. to accept unanimously its suggestion.

Charette, and which distance alone prevented his conveying the same to his "little woman," the cheers grew lustier as "three and a tiger" concluded a most appropriate break in the drier proceedings of law-making.

Questions arose as to reading reports in both French and English. The French-speaking delegates present waived the necessity of this being done with all reports, but where it was desired, Montreal President Telles Latourelle and Quebec Vice-President J. E. Walsh, made the necessary verbal translations.

Supply Men—Trade Papers

On Wednesday afternoon, the convention welcomed supply men and representatives of the manufacturers. The number attending was considerable, and general appreciation seemed to manifest itself on the part of both the delegates and the visitors. A welcome was extended by Dominion Vice-President Myers of Stratford, and he asked the supply men and trade paper representatives to introduce themselves.

Speaking for the supply men, W. L. Helliwell, Montreal manager of the Gurney-Massey Company, stated that it was the desire of the supply houses and the manufacturers, as far as he was concerned, to take care of and protect the legitimate trade. Other speakers followed and a very considerable amount of discussion took place. Subsequently the incoming executive committee was authorized to take up with the manufacturers and supply houses, any questions suggesting themselves for discussion or adjustment.

Representatives of the trade papers spoke very briefly, and expressed their pleasure at being present.

Secretary Garrett Frankland suggested, at this juncture, that it was a good plan, and, in his opinion, the keynote of future progress, to get together in round table conferences if progress was to be made.

Some discussion took place relative to the publishing of net prices in trade papers. This matter was referred to the executive for attention.

Election of Officers

Interest centred in the election of officers, naturally, in view of the forward steps which the convention felt it necessary to plan for, as hereinbefore referred to. The completed slate, as slightly revised when presented to the convention by the nominating committee, appears elsewhere, and was unanimously adopted.

Installation of the new office bearers brought committals from each that the work of the society would be given their best effort, and that they sincerely hoped another year would reveal the fact that real progress had been made. To this end, all voiced their determination to work hard, if need be, that this be accomplished. President-elect F. R. Maxwell left no doubt as to the benefits that might be derived from a man-to-man understanding as between employer and employee.

"On behalf of the officers-elect I would ask every member to do his best, answer communications, do things at the moment when they should be done and remember to co-operate," was the simple and direct message of Mr. Maxwell.

"We must hold the field or there will be 'ready-made' plumbing," said T. J. Minnes, the Ontario vice-president-elect. "This plumbing business of ours has a great future; there is great work ahead and we shall undertake it with energy."

The foregoing expressions contain much of the splendid spirit voiced by each of the officers chosen, and the 1919-20 officers were duly considered installed.

Votes of Thanks

In appreciation of the kindness of the trustees of the Caledonia Curling Club, a resolution was passed expressing thanks for the use of their club rooms as convention headquarters.

Votes of thanks were also tendered the Montreal Association for its kind entertainment accorded the visiting delgates, and another to the retiring officers. Special appreciation was expressed by various members of the service rendered by the trade papers, and a resolution was framed to convey this expression to the papers which had assisted in various ways to better the interests of the trade, and in also helping to make the convention a success.

WHAT THE CONVENTION DID

Centralized officers with view to frequent meetings.
Appointed Dominion paid secretary.
Appointed delegate to Atlantic City Convention.
Chose Toronto as next Convention city.
Decided on forward movement.
Recognized need of greater co-operation.
Urged closer reading trade papers.
Endorsed monthly bulletin scheme.
Recommended representation on Boards of Health.
Approved Whitely report and Goodwin plan, generally.
Tangibly recognized retiring secretary.
Suggested more round table conferences.

Illustrated Lecture

On Wednesday evening an illustrated lecture was delivered by A. J. Dickey of the C. A. Dunham Co., Toronto, on Modern Heating, assisted by A. Kastello, of Montreal. Owing to the excessive heat the attendance was not as large as it would otherwise have been, but the lecturer entertained and informed his hearers most acceptably. He curtailed his address somewhat out of consideration for his audience, who had withstood great discomfort from the heat for a long, trying session during the morning and afternoon. The lecture of Mr. Dickey was interesting and instructive, and those fortunate enough to attend were repaid for any sacrifices made. The lecture, illustrated, appears elsewhere in this issue.

The Lighter Vein

That Montreal is some convention city will not be denied by the visitors. If there were several sleepless nights, these were none the less entertaining, for provision in advance had been made for the entertainment of the delegates.

"Princess Theatre night" was a success from all accounts, and the social time spent there by the delegates, their wives and lady friends, served to drive away for a brief space of time, the thought of discomfort brought by midsummer heat, generated on the opening day of the convention. Tickets? ? ? Why, "Jim" Griffin, the genial chairman of the entertainment committee, simply said with all his heart, "Fellows, don't go without tickets, there are plenty of them; bring your ladies and as many as you like." Yes, there was entertainment for all, and without stint.

But this was only the beginning. Hard work in earnest was the lot of the assembled delegates on Wednesday and Thursday in particular. By dint of speedin' up, the proceedings came to a successful termination on Thursday at one o'clock, and after "a wee bit refreshment" the boys assembled on McGill University grounds to get "a' their pictures took." The ideal setting of these quaint old grounds was a delight, and following a brief sojourn here, waiting automobiles conveyed all to the corner of St. Catherine and Alexander Streets, whence a delightful electric car ride was taken about the city, and terminated an hour or so later at Dominion Park, the Summer watering place for Montrealers and their friends. Here at last, the weary and hard worked delegates and their friends, wives and sweethearts made free with one another, strolled about the spacious grounds, viewed the Plus Grand Boeuf, took in the scenic railway, gyroplane, mystic rill, the laughing gallery, victory ride, etc. Dizzy heads, some of them, but they were glad to indulge for a brief hour.

The grand conclusion to this whirl of entertainment came shortly after six p. m., when about one hundred delegates, with their wives and friends, sat down to a delightful dinner in the open dining hall of the big park, immediately overlooking the mighty St. Lawrence, and up and down which ocean-going and lake boats plied their way continuously. The feast reminded one of pre-war days, when caution was an unknown requisite in banquet preparation.

Surely the entertainment committee had its own reward in seeing the bevies of smiling delegates, wives and sweethearts, which left no doubt as to their decided pleasure and appreciation. The supply houses and manufacturers contributing to make this extensive entertainment possible, must indeed have been gratified with the success attending their efforts. It was complete.

Convention Smiles

"Pay As You Enter," motto of the Montreal Tramways Company, was not that of the Convention Entertainment Committee. There was nothing too good for the delegates and their friends, and Jim Griffin and B. J. Morris were ever on the job with free tickets to everything.

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Retiring Vice-President C. R. Myers, of Stratford, declined the honor of accepting the Dominion Presidency. He left no doubts as to his interest in the work, and will be heard from again. "Cash, Confidence, Co-operation," was his motto.

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John A. Gordon, Montreal, says that the Convention set a big pace for an ordinary individual to follow. One had neither time to eat or sleep—just for a good pipe and a wee drop o' —— occasionally.

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Considering the fact that retiring secretary John Watson attended 17 meetings of the sub-executive committee within 18 months, it was remarkable the manner in which he provided for the ladies' comfort on Entertainment Day.

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"Oh, you mosquito!" Now, Mr. Plumber, far away, don't smile over much. The Windsor and the Queen's are mighty accommodating hostelries, but they have not catered to heating engineer delegates for some time and the supply of fans was short. That's why the boys didn't turn in before 3 and 4 a.m.

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Hot lead isn't in it with 95 in the shade in a Convention Hall. Ontario President T. J. Minnes set a fine example of defiance to the weather man when he dropped his collar and tie, rolled up his sleeves, and put up some hotter arguments that lent real ginger to discussions.

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Past President Alex. Charette set the Convention Hall ringing when he presented incoming President Maxwell with a huge bouquet of beauty roses. The quick following of presentations to Secretary John Watson, culminated most happily when President-elect F. R. Maxwell passed the flowers on to "John." The singing of "See Him Smiling," was really great. Faithful John will surely remember this occasion as one of his greatest.

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One would think the tables were turned back and that pre-war menus were even eclipsed. The dinner to delegates and their friends at Dominion Park Thursday night will long be remembered. And, mind you, Secretary B. J. Morris, once his eye rested on you, would permit of no delegate or accompanying friend paying for anything. It was a royal treatment, boys. You who are far away just missed the finest time ever.

Telles Latourelle, the Montreal president, calmly told the Convention that he sat up with some of his confreres until four a.m. discussing matters relative to the trade in Quebec. This looks like real work. There was a very serious attitude on the part of the Quebec delegations.

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John Watson's pronunciation of Montreal in true French is perfect. Telles Latourelle said that John listened intently to the discussion above mentioned, but that he did not understand a word of it.

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Harry Mahoney (at the Park dinner): "Please pass the Worcester Sauce; that 'extra dry' was super-extra."

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Secretary Garret Frankland enjoyed the dinner, well, yes. Oh, for another platter of those "French-frieds."

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J. P. Kennedy worked early and late to take the official minutes of the Convention. His services were surely appreciated by the boys, and stepping in at the eleventh hour, as he did, his work was the more appreciated.

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"O, for one good ball game," said one enthusiast of the bat as we strolled up good old McGill grounds. It is wonderful what charm the proper setting has for an old baseball-plumber.

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Jim Griffin and John A. Gordon divided honors in the refreshment section of the Convention Hall. Since this arrangement worked well there was no lack, but—Oh, how that cupboard suffered!

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All jokes aside, this was said to be the dryest and hottest Convention on record. There was a remarkably good spirit, and a lot of hard work was put over.

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Talk about beer—it just flowed, and then stood out in great beads on the forehead. But big, beaming smiles shone through, nevertheless.

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Peter Ogilvie, as Sergeant-at-Arms, was in fine fettle. In conducting the newly-elected officers for installation, he was right at home, and performed never so gracefully.

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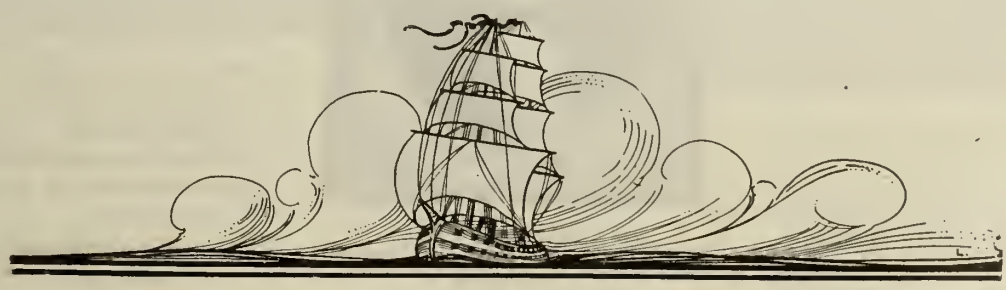
The Secretary: "A young lady reporter is at the door and seeks information."

A voice: "I propose that she be permitted to meet the president."

Another: "John Gordon, as the best looking man, should be chosen."

Finally a compromise was arranged and G. Delaney and John Gordon proceeded to the reporter's room as a "press" committee.



Reports From C S.D. & S.H.E. Officers

President's Report

Read by ALEX. CHARETTE, Montreal, Que.

"IT IS more than a pleasure for me to present you the following report as brief as possible of the twenty-second convention of our organization.

Since our last gathering in London, Ont., events of different importance have taken place, some of which have brought joy and happiness, while others developed sadness, changes, etc. The great conflict of democracy and autocracy has shaken humanity in its bases. Where is the man who has not borne his share of the burden to bring victory to our glorious cause? Members of our craft have given generously—their life, their sons, their time, and their money—and I take this opportunity of expressing my admiration as well as my deepest sympathy to all of them. Since we last had the pleasure of meeting many have fallen from the ranks and gone, but let us keep a good and hearty remembrance of them.

Now that peace is about to be declared, there is no reason not to unite and help to rebuild what the storm of war has damaged and to this effect allow me to submit for your consideration the following ideas:

1. Why not at this convention take up seriously the matter of a Federal Code for the craft? This matter has been discussed at previous conventions, but

simply ended in nice words and lengthy speeches.

2. I must also call to your attention the important factor of bettering conditions of trade with the manufacturers and supply houses. Much has already been done, but further steps should be taken regarding prices, terms, etc.

3. Another thing I should like to see ended altogether is the question of tendering "en bloc," which is antagonistic and contrary to the best interests of each and every one of us. A strong campaign should be started against this manner of awarding contracts. I think this would be a good point to discuss thoroughly.

To these brief suggestions allow me to add my most sincere thanks to the members of the executive and assure them of my hearty appreciation for all they have done to lessen my work and responsibility, which I feel I have accomplished to the best of my knowledge and with all the faculties I could bring to bear in the performance of my duties as president of your Association.

I am also glad indeed to thank the SANITARY ENGINEER, PLUMBER AND STEAMFITTER of Canada and its young companion, THE SANITARY AND HEATING JOURNAL, as well as the *Plumbers' Trade Journal* of New York, for the great part they have played in the development of good relations and fellowship between the members of the craft at large and in the name of the Canadian Society of Domestic, Sanitary and Heating Engineers. I would ask them to continue their good and effective work for the benefit of one and all.

PRESIDENT CHARETTE'S ADDRESS

MESSIEURS:—Il m'est agreable de vous soumettre le rapport suivant de la 22ieme. convention de notre societe.

Depuis la derniere convention tenue a Londres, bien des evenements se sont succedes, pour les uns les evenements ont ete heureux, pour les autres les evenements ont ete malheureux.

La guerre europeenne est venue smr la pertubation dans l'univers. Quelques-uns parmi nous ont eu a deplorer la perte d'etres cheris. A ceux-la j'offre mes sympathies les plus sinceres. Depuis la derniere convention de Londres, la mort est venue faire des victimes dans nos rangs. Ayons un pieux souvenir pour les confreres disparus.

Rejouissons-nous tous la paix a succede a la plus cruelle des guerres, maintenant envisageons l'avenir avec confiance et preparons nos armes pour l'apres-guerre et faisons en tous les efforts possibles pour attendre les buts que nous desirons.

Maintenant, messieurs, laissez-moi vous soumettre les quelques points suivants:—

1. Plus d'une fois il fut question d'un code federal pour tous les Plombiers du Dominion. L'idee est belle et je voudrais la voir se realiser. Jusqu'a ce jour il a fallu nous contenter de paroles, maintenant agissons et prenons les moyens voulus pour que le Gouvernement Federal etablisse ce Code, qui sera la regle a suivre pour tous les plombiers du Canada.

2. Une lacune qu'il faudrait compler. Presque toujours les soumissions sont demandees en bloc. Cette maniere de demander les soumissions nous cause du prejudice. Je me plais a reconnaitre qu'il y a eu du progres de fait sur ce point. La marge a remplir reste encore considerable.

CALER CHARETTE
Of Monteral Retiring President C. S. D. and S. H. E.

3. Nos relations d'affaires avec les fournisseurs se sont sensiblement ameliorees. Cependant il reste encore beaucoup de chemin a parcourir. Nous devrions reclamer tout ce qui nous est legitimement du. Je ne voudrais pas brusquer les choses. Si nous desirons une amelioration nouvelle touchant nos relations, faisons-en la demande aux fournisseurs et travaillons a les amener a la discussion, mais restons toujours unis. Convaincu suis-je que nous obtiendrons plus en faisant un bloc solide, qu'en se divisant. La devise des unions a parfois du bon:

"United we stand, divided we fall."

4. Avant de conclure ces quelques notes; je desire offrir mes remerciments bien sinceres a tous les officiers et a otus les membres qui ont bien voulu me venir en aide pendant mon long terme d'office. A tous, je dis un chaleureux merci.

5. Je dois aussi un tribut de reconnaissance au vaillant "Sanitary Engineer" ainsi qu'a son jeune frere le "Sanitary Heating Journal" et "Le Plumbers' Trade Journal," de New York, tous trois ont bien travaille et ils meritent non seulement la reconnaissance mais aussi l'encouragement de tous les membres de l'association.

Le tout humblement soumis.

President C.S. of D.S. & H.E.

Vice-President's Report

Read by C. R. MYERS, Stratford, Ont.

FELLOW Officers and Members: We are today gathered together to officiate on behalf of our craft in the interests of the Canadian Society of Domestic, Sanitary and Heating Engineers, and we all surely recognize the immense field of possibilities and opportunities that lie ahead of us, and especially to those who are to continue the work of this Canadian Society, if we as a craft are to secure the desirable conditions that are our just due.

Since last we met in London some two years ago the terrible conflict of might and right that had waged for over four years has now been brought to a successful conclusion as far as the actual field of battle is concerned, and it now rests in the hands of our worthy statesmen to get results that we hope will for all time assure the world of freedom from oppression.

Many of us have lost dear ones and our craft in general has suffered greatly in the loss of several of our members, all of them good and worthy members and a credit to any profession.

We have also had several of our members returned suffering from casualties of different kinds, which will in itself go to prove that our craft was well represented in the big show, and I feel sure the record of our members will stand second to none for valor and effort while in the ranks of the soldiers of our nation.

Generally speaking, I as your vice-president have no great record or program of accomplishments to set before you for the past two years, because as you are well aware we did not hold our annual convention last year on account of the war and therefore did not have a definite program mapped out ahead of us, and the officers of the previous year were requested to retain their offices and merely continue on as economically as possible until the war was brought to a successful conclusion.

Gentlemen, the time has now arrived, and we have come to Montreal today to place before you the absolute necessity of better organization in its most aggressive form, so that we may place our Society in a position of authority and trust for our whole craft throughout the Dominion of Canada.

The possibilities of today so far as organization is concerned are ideal and never in the history of our Dominion were they so essential as now because during this reconstruction period we are morally bound to protect our interests more so than ever in the history of our craft. To do this requires capital and an unlimited amount of energy on the part of all our members, as well as our officers, and it requires more confidence in the rights of our Society and its members in the eyes of the general public. Remember the three great essentials are cash, confidence and last, but by no means least, co-operation. By co-operation I do not merely mean co-operation among ourselves, but I also mean a broad platform of co-operation between ourselves and our employees.

Many indeed are the avenues open for improvement of methods of operation among our members in conducting their business in a modern way, and many indeed are the possibilities to be looked forward to and reasonably expected to bear fruit through the organized co-operation of the members of our craft and the organized co-operation of the members of the different labor organizations pertaining to our particular business.

I wish to draw your attention to the fact that during the last week of April and part of the first week of May a deputation composed of thirteen members of our craft from Toronto, two from Guelph, one from London and myself from Stratford spent five days in Detroit attending different club meetings of the Detroit Association of Master Plumbers and Steamfitters, and the information and instruction we received while there was certainly a wonderful revelation to us to see the harmony which exists there between the members of our craft and their employees, as well as between the members of our craft and the manufacturers and jobbers, and it certainly made us feel that there is a great future before us all when we get the same conditions here in Canada as exist at the present time in the U. S., and especially in the city of Detroit.

While there we also paid a visit to the Windsor, Ont., Master Plumbers' Association, and found them to be only about 50 per cent. efficient. However, before we left Windsor we had succeeded in instilling new life into that organization with the result that on the following Thursday, May 1st, the Windsor Club accompanied us to a meeting of the Detroit Central Association and were greatly impressed with the progress and interest manifested by the Detroit Association. Since returning from Detroit I may say that all the cities throughout Western Ontario have reorganized along the lines of the Detroit Association, beginning at Windsor, Chatham, London, Stratford, Kitchener, Guelph, Brantford, Hamilton and Toronto. All are now or will be in the near future working harmoniously together with the same end in view—better organization among our own members and a more friendly co-operation with organized labor.

HERE ARE SOME OF THE GOVERNORS

New officers of the Canadian Society Domestic Sanitary and Heating Engineers, photographed specially for SANITARY ENGINEER. *Left to right, the officers are:— D. A. Bethune, Montreal; Joint Chairman, Heating and Ventilating Committee, H. Mahoney, Guelph; Vice-President; Garret Frankland, Toronto; Secretary; E. H. Russell, London, Chairman Essay Committee; F. R. Maxwell, Toronto, President; Thos. E. Ferguson, Ottawa; T. J. Minnes, Brantford, Vice-President.*

SOME PAST PRESIDENTS

As snapped on McGill University Grounds for SANITARY ENGINEER. *Left to right:—J. E. Walsh, Montreal; Alex. Charette, Montreal; E. H. Russell, London; John Watson, Montreal; John A. Gordon, Montreal. Some happy, smiling boys, they will continue to watch the growth of the Society with interest.*

These same conditions are easily obtainable throughout Canada if we will only wake up to the fact that we must put more confidence and personal energy behind our Canadian and Provincial societies and simply go out to attain the same protection and co-operation among all the different interests concerned with our particular craft.

Just here allow me to make a suggestion which I feel is of great importance to the success of our Canadian Society.

That in order to obtain the desired results it is my opinion that the president, vice-president and secretary of the Canadian Society shall all either be residents of one city or at least should be centrally located, that is, be within a radius of 100 miles from the place of residence of the president, so as to facilitate matters whenever the president desires a conference with the other officers. The way it has been in the past where, for example, the president of today resides in Montreal and the vice-president in Stratford, over 400 miles apart, so you can readily see how difficult it has been or would be in the future under like conditions to obtain the best united efforts of the different officers. It is my firm conviction now with the greatest opportunities and possibilities directly ahead of us that our Society should exercise great care in electing new officers to have them located within easy reach of each other, because if we ever expect to obtain the desired results, the officers will be obliged to hold frequent conferences on Society matters and especially in connection with the co-operation to be obtained from the supply houses and also from organized labor.

In closing I desire once more to again mention the absolute necessity of greater organization for our craft in Canada first of a local nature, and secondly of a provincial nature, so that the desired benefits and results that should be and are justly ours may be forthcoming through our united efforts. It is for us to decide today on our future policy in this regard and I say unhesitatingly that all members should be up and alive to the future prospects or we as a body will be wiped off the map entirely. Now is our golden opportunity. Do it now. Put ourselves in the limelight and make all others feel that we are on the map of this Dominion, and on it to stay.

I wish to thank the members for the honor placed on me during the past two years and trust that my actions during that period, and that this report will meet with your approval.

Gentlemen, I almost forgot to mention our trade journals, and I now take this opportunity to express my deep appreciation of the good work our trade journals are doing for us, and I especially recommend to our society the advisability of lending our whole-hearted support to these journals

Secretary's Report

Read by JOHN WATSON, Montreal.

IN PRESENTING my report for the past eighteen months or since our president saw fit to appoint me as secretary of this society, with the very limited time

J. E. WALSH

Of Montreal, Secretary of the Canadian Society who read the Secretary's report at the Annual Convention in Montreal.

at my disposal, you will notice there are several changes made in your officers since the last convention in the city of London, Ont., four offices having been vacated during that time, and on account of the president endeavoring to secure substitutes was the cause of some delay during the year 1917.

However, I feel that our Society has made some progress, although we have had three troublesome years, our membership has increased slightly over 1917-18, and is once more in good shape to proceed with such business as may be brought to its attention. I regret that the officers and members have not seen fit to send in notice of motions or other documents pertaining to the work which is to come before this meeting. If this were carried out in accordance with article 18 of the by-law, every delegate would come to the convention fully posted on what is to come up and also have the benefit of the advice of his local organization.

The by-laws have been amended as authorized by the London convention and are now complete and up to date, but there is no annual report in book form this year, but the minutes of the last convention have been placed on file, although nothing special seems to arise out of those minutes to bring to the attention of this body. Every member seems to be on the best of terms with the supply houses, and there has not been a single case where a special grievance committee has been called for.

I wish to draw the attention of this meeting to the lack of interest taken by the Essay Committee, who are supposed to prepare papers to be read for discussion at all local meetings. This has never been done, and as a rule this Committee is never completed—the chairman is appointed at the annual meeting, and if he considers the matter at all it is only when he is called upon for his annual report.

There are two special matters that should be taken up at this meeting; one is in reference to the issue of a monthly bulletin; also the matter of the New Brunswick grievance and T. McAvity. The correspondence on this matter will be found on the file under the heading of R. E. Fitzgerald, W. J. Crawford, D. Shea and J. McKinley.

The incoming secretary will find on the file a sheet showing the standing of each local or provincial society; also the number of members in good standing for each year from 1916; also a list of plumbing firms throughout the Dominion.

The sub-committee held seventeen meetings during my term of office. There has been considerable correspondence and it is gratifying to know that I have received letters from all the officers and chairmen of the committees with the exception of three provincial vice-presidents and one chairman. However, I have great hopes of receiving word from these gentlemen before the close of the meeting.

We have received four new members into our society, all from the Province of Quebec—A. Blondin, St. Hyacinthe; R. J. Williams, St. Lambert; J. A. Landreville, Joliette, and E. G. Brousseau, Quebec. These gentlemen have not yet any local society in their towns, but we expect with their efforts we will soon have a thriving Master Plumbers 'Association in each place.

The thanks of the meeting are due Mr. N. B. Roantree, provincial vice-president for Saskatchewan, for the able manner he has organized the Provincial Society in Saskatchewan. His annual report will be found on file and is a credit not only to themselves, but to a much older society. Their returns show twenty-three members in good standing.

I cannot allow this occasion to pass without drawing the attention of this convention to the serious loss to this city and in fact the whole Dominion of Canada in the death of our esteemed member, Mr. W. R. J. Hughes. He was a friend to all who came in contact with him, always willing to lend a helping hand, absolutely upright and honest at all times. He was a member of the executive for a short time and was a serious loss to that committee.

Thanks are due our trade papers for their noble support and assistance and deserve the good will of this Society.

I wish to draw your attention to the letter of W. C. Miller, a returned soldier, and he should have the assistance of the trade.

In retiring from office I wish to thank the several officers for their excellent support and I must say they have been

1. *Retiring Vice-President C. H. Meyers, whose report was encouraging and whose advice on co-operation and education was appreciated by the Convention. Mr. Myers is very proud of his native city of Stratford and fully as proud of the Plumbing and Sanitary by-laws under which he and his brother plumbers are working. He placed a set of these by-laws on the table for the examination of those interested.*

2. *Edgar G. Brousseau of Quebec City. Mr. Brousseau is President of the Quebec Builders' Exchange and an ardent Master Plumber who is out to make his native city a big factor in Association matters. In speaking to* SANITARY ENGINEER, *Mr. Brousseau said that he was pleased with the proceedings "but I thought it was better to be a good listener the first time." he said. Great things are expected of Quebec.*

3. *"Jim" Griffin—Entertainer, Montreal Association genial entertainment Committee Chairman. There was nothing lacking in the generosity of these folk and due acknowledgment was expressed by the delegates before they dispersed. Mr. Griffin wore one great big smile for three whole days—yes, they were hot ones too.*

very patient with me for the past eighteen months. If I have been rather strong in some of my letters I wish to apologize, but at the same time the fault was not all mine, for when you write an officer five or six times and get no reply the chain tongs or something else has got to slip. Moreover, my endeavor is for the best interest of our Society, which I hope will thrive and prosper through the coming years, and the work of our retiring officers will not be all in vain.

Provincial Vice-Presidents Send Reports

Alberta Vice-President's Report

Read for JAMES MARR.

IT IS with feelings of thankfulness that I now indite this epistle to you that the war which has been ravaging the major portion of Europe for the past five years is almost at the close. Let us hope and pray that a settlement of all national troubles may soon be arrived at and that each and all will settle down to the building of broken and ruptured cities and towns, that domestic troubles may become nil when peace and prosperity may continue to flourish throughout the land.

Since my last report things in general have improved and prospects look brighter for the future. Only for this little cloud of the sympathetic strike we would be sailing along with a fair supply of work at a fair price. We have something like twenty-five members in our local society, with probably five others outside. These in a measure prevent the harmony that a full membership of all the shops would give, but I suppose friction is one of the great drawbacks to all machinery, but we must just keep oiling up to keep it down to a minimum. The meeting of the provincial members of which I wrote you some time ago has been productive of much good. A committee was appointed to wait on the Minister of Public Health with the object of amending the proposed new laws to the Provincial Health Code. The Committee was well received and I understand are now busy with suggestions for a future meeting with the Provincial Board of Health.

I hope to be able to report at a later date that the Associated Sanitary Engineers of the Province of Alberta have arrived at a fixed basis of charges with standard health laws as applied to domestic engineering and a rigid enforcement by and inspection of all installations by practical certificated engineers and inspectors, and this should redound to the credit of and make Alberta one of if not the healthiest province in the Dominion of Canada. With best wishes to all the members present and a profitable convention is the hope and wish of yours faithfully.

Saskatchewan Vice-President's Report

Read for N. B. ROANTREE.

IT IS with a great deal of regret that I am forced to write this report to the convention in place of being there in person. But conditions are such that it is impossible for us to get a delegate down for this year, but next year you can all count on our little Province being represented.

At our provincial convention this spring I brought up the matter of sending a delegate to Montreal, and it was thoroughly debated on, but the feeling was that it would be impossible to send a delegate this year, chiefly because it would cost such a large amount, and as you know, we have just organized and find so many things to do and they all cost money, so it was the feeling of our meeting that we would have to go slow, but next year we will be stronger and I hope you will see more action from Saskatchewan. I have asked our secretary to mail you a complete outline of our Provincial Society so you can see how we are getting along. We want you to feel that you have the Province of Saskatchewan with you and the officers will have our loyal support for the coming year.

The writer had fully intended up until a day or two ago to be in Montreal for the convention himself, but am doomed to disappointment, as it is impossible for me to get away for ten days or two weeks, but I will be with you next year wherever you may hold your convention.

Kindly remember me to all my good friends in Montreal, and wishing you one and all the best of luck, and I hope the convention in Montreal will be a real success.

Ontario Vice-President's Report

Read by GARRETT F. FRANKLAND.

AS YOUR Provincial Vice-President from Ontario during the past three years of our Canadian Society of Domestic Sanitary and Heating Engineers, I wish to report progress and trust that same will meet with your approval.

During the period of the war we were only marking time, but since the armsitice was signed, activity has been our first name and genuine results have been obtained to date in not only inquiries regarding membership, but an actual

JAMES MARR

Vice-President of the Alberta Association who sent in the report of that organization.

increase of 65 per cent. over our roster of 1918.

At our recent Ontario Society annual meeting held in Toronto on April 4th last, life was again instilled into our craft throughout Ontario and our aim and desire as far as Ontario is concerned is to see our craft throughout the Dominion assume its proper place in our national provincial and municipal affairs.

I also place before you several articles for your consideration and trust that good will ensue to all from same.

1. The adoption of the Goodwin plan in some regards by the Canadian Society would go a long way to improve the prevailing conditions in our business at the present time. I refer to the need of an active educational programme by all those engaged in our calling, along the proper methods of carrying on our business and as to the proper merchandising methods of our commodities. These are the duties of not only ourselves but to my mind are also the affairs of those who supply and make the material which we install.

Gentlemen, the above means co-operation and we need just that. First among ourselves, with our employees, second and thirdly between our manufacturers and wholesalers, for are we not all engaged in one enterprise that goes to ensure to our fellow citizens better sanitary and ventilating conditions in our homes and buildings and thereby perpetuate for our country a race of healthy, strong and able-minded people?

2. The idea of a central permanent office for our craft would be sustained, not forgotten, where constant touch would be kept with the trade and its doings throughout the whole Dominion and be an exchange for all information between the members.

3. The serious consideration of the open price plan or tender system is recommended to every local organization.

4. The great need of appointing officers who will officiate, and I trust that in the new officers to be appointed at this convention, workers only will receive the award of office, for if we are to attain results that count, everyone must be up and doing, officers as well as the rank and file.

5. I also wish to make mention of the one source that will give to us our future craftsmen, our apprentices, and wish to have all the members just think of what is going to happen to our business if proper attention is not given to the problem of our boys.

6. To our trade journals and those of our American neighbors the entire craft owe a debt that can only be repaid by tangible results, so subscribe to them all, say I, for knowledge is wealth and abundance of that is yours if you will but read the columns of our trade journals.

7. I must make mention of our brothers engaged in our calling throughout the United States. To them we can well afford to look for ideas, as they are greater in numbers and should necessarily attain improved conditions in a larger measure, and from my knowledge of their affairs they are progressing. At their coming convention in Atlantic City on June 17th and 18th and 19th next many important matters will come before their meeting, and I would advise that this society send a representative to attend their convention, having received an invitation to that effect from their president, who, believe me, gentlemen, is a live wire in every respect.

In conclusion, to our brother craftsmen in the sister province we extend greetings and a hearty invitation to the Society to hold their next convention in

ON McGILL CAMPUS

After completion of the Program delegates to the Annual Convention Canadian Society Domestic, Sanitary and Heating Engineers posed on the campus of old McGill University and were photographed especially for SANITARY ENGINEER.

Ontario at a point to be decided upon later.

Thanking you one and all for the honor placed in me as your Provincial Vice-President for Ontario, I am yours for co-operation.

Quebec Vice-President's Report

Read by J. E. WALSH.

YOUR Provincial Vice-President's report for the Province of Quebec covers a tenure of office of but three months' duration, and is, consequently, limited in the amount of ground covered. The present incumbent, the third since your last meeting, accepted the appointment principally out of respect for the memory of his predecessor, and with the wish to help complete the work the latter had begun. First of all it should be recorded that if any success has been achieved, it is due in the greatest measure to Messrs. Charette and Watson, your Canadian President and Secretary, respectively.

As a sub-executive we endeavored collectively to organize the province with the result that although we cannot definitely report the formation and addition of any new local, yet we were successful in securing individual members from the cities and towns of Quebec, St. Hyacinthe, St. Lambert and Joliette. Furthermore, we are still in communication with the splendid Quebec association and have not by any means abandoned hope of its ultimate affiliation with our Canadian body.

As in the past, the principal association work has been confined to Montreal. Since the last convention the outstanding features are four, viz.:

1. An energetic campaign for French-speaking members which resulted in the addition of several sterling firms to our list.

2. Conferences with representatives of supply firms, concluding with an increase of 5 per cent. in the trade discount on heating goods.

3. Framing of modern sanitary by-laws, which we understand will be put in force by the city administration on the first of the year.

4. Proposed collective membership in the Association of Montreal Building and Construction Industries on condition that the general contractors refrain from including in their tenders prices for the plumbing and heating work, or, in other words, that the plumbing and heating estimates be left exclusively to the Master Plumbers with the sole right of dealing directly with the owners, architects and engineers.

As your worthy secretary tells me that an officer's report is not complete unless it contains some suggestions tending to the improvement of the National body, I will respectfully suggest that the incoming secretary be instructed to read over the minutes of all the conventions held by this society during the past ten years and prepare therefrom for the incoming executive a list of all the excellent recommendations proposed and adopted, but in nearly every instance never put in force. A copy of these

N. B. ROANTREE

Of Swift Current, Sask., who sent in the report of the Provincial Association, Saskatchewan Sanitary and Heating Engineers, of which he is president.

resolutions could then be mailed to the different locals and should prove of material assistance to them.

It might prove a wise plan if at every future convention a few hours were allotted to the discussion of the best means to be adopted by the different locals to arouse enthusiasm among its members. An exchange of ideas with due allowance for local conditions should tend to the advancement of the main body through its branches. Our national association is diametrically opposed to most business concerns, inasmuch as it practically owes both its existence and maintenance to its branches. Is it not, therefore, our bounden duty to give our best thoughts to the parts which constitute the whole? Let the officers and delegates at the ensuing conventions come prepared to answer at least one of the following questions: Is your association in the rut, and if so for what reason? Did your association succeed before, and if so, by what means? How can your association if in the rut be placed on a substantial footing? I feel keenly that nothing should be left undone to make the locals as interesting and as productive as possible to their members. Suggestions should be received from the delegates of the different cities and the most logical and practical tabulated by the Secretary for our future guidance. By all means let every unit know and understand the practices which have been found to be of advantage and the pitfalls which are to be avoided. It should then be an easier matter to establish new locals and assure the success of the existing ones.

Since your last convention your society and principally the Montreal Association has suffered a great loss in three of its members—W. R. J. Hughes, Theophile Lessard and Eric Selkirk. In the last report I submitted at Calgary convention I can clearly remember I had the sad task of recording the death of the late W. J. Hughes. Little did I then imagine that so soon I would have to announce at another convention not only the loss of his distinguished son, Willie, as he was affectionately known to us all, but also the demise of two of our most prominent members. Again I can only say with the keenest of personal sorrow: They have gone to join the ranks of the great majority whilst our hearts beat with sincere sympathy for the loving relatives from whom they are parted.

In conclusion permit me to add my share of thanks to our official organ, THE SANITARY ENGINEER, and to the new "Sanitary and Heating Journal" for the valuable assistance rendered. In our official acknowledgment I should like to have specially mentioned the names of Mr. Edwin Newsome of Toronto and Mr. Hartwell Illsey of Montreal.

New Brunswick Vice-President's Report

Read for W. J. CRAWFORD.

IN PRESENTING my report to your society I wish to thank you for the honor you have conferred upon me in electing me to this important office.

I have appreciated your aims and efforts to fraternalize the trade from coast to coast and as your representative on the coast on the Bay of Fundy and the Province of New Brunswick I hereby submit the following reports of association and trade conditions in this section with a few of my personal recommendations for the uplifting and aggressiveness of our society in this our fair Dominion.

I also wish to thank your executive officers for their untiring efforts and also their kind letters and cards at Christmas and Easter season. Small remembrances like these create the proper spirit of fraternity. There is no use to make any comments of the conditions that we have gone through the last four years, but only now is the time for advancement and construction.

Well, gentlemen, I am very pleased to state that the Province of New Brunswick is still organized as a body and is very much alive. We have held our regular annual and semi-annual sessions and we have a live set of officers: G. S. Dorman, Moncton, president; R. E. Fitzgerald, St. John, vice-president, and H. W. Thorne, Fredericton, secretary-treasurer.

We have almost every sanitary and heating engineer in the province in sympathy with our aims and objects and I might also state that at our last semi-annual meeting held in St. John in January we passed a resolution that the

New Brunswick society will retain their membership in your Canadian Society, but at the same time I am sorry to state that no delegates were appointed, the feeling being that any who could or wished to attend would be given the necessary credentials, but would finance the same personally.

I also wish to state that the cities of Moncton, Fredericton and St. John have good, strong local organizations. St. John has thirty-three members holding meetings every second Monday of the month; also that we have strong representatives on our different health boards and having members on our boards and qualified plumbers as inspectors.

We are receiving numerous applications from those wishing to join our provincial and local societies, showing that by being organized must be an improvement over which we all use to practice, that is, as a whole we can accomplish much and individually nothing, besides the better feeling among all.

I would like to ask you gentlemen what becomes of your convention meetings. Reports and resolutions passed at your different sessions. I know they are printed and distributed, but I cannot see where any action is taken, where results are gained. I have been much interested in association matters this last ten years, and I must confess there has been a lot of waste time and paper.

I believe that we, the engineers of the Dominion, should have the same recognition as the national profession or if anything a higher personal respect. This is one of the things that no action is taken on. You meet and do your business and have entertainments and after that you go home and get back in the rut again. This is the reason why our profession is not advancing. What about the manufacturers, what about the jobbers? Do they meet and go into the rut? No. They come right along with an advance of price.

I have attended two of your conventions and I would like to see your committee not being afraid to tell the manufacturers what is in your mind; also have committees wait upon the Government and prove to them that we are not associated for personal privileges only, but for recognition of a profession that should be respected. We are the people who should be given recognition on our health boards throughout Canada. We should also be given the chance to tender to the Government individually on all Government contracts, not as sub-contractors, and take all the risks of the general contractor who is eager for the job, and in many cases figures too low, and the members of our trade have got to stand the loss with him.

I wish to recommend to your society that at this session your Ways and Means Committee take into consideration the cost of printing and distributing to each member who has paid his per capita tax a certificate along the line of the sample enclosed, which we use in the province, and which is issued each year in different colors with the president and secretary's signature and also the seal of the Society. I also wish that all travelers from all manufacturers and supply houses inquire for these certificates which should be placed in a frame and hung in a prominent place in our offices. You will be surprised at the results within a short time, and you will have inquiries of how to procure them and in this way our members will get interested. I have proven it in this province.

I am sorry to say I will not be able to attend this convention, but my mind will be there on June 3rd, 4th and 5th, and will watch proceedings through the press.

In closing, New Brunswick sends best wishes for a prosperous business convention.

THE RETIRING SECRETARY

John Watson, Montreal, was acclaimed a regular old war-horse, so often has he come to the fore when there was need of help to carry on the secretarial work. Mr. Watson is also a Past-President. Here he is in holiday mood as snapped for SANITARY ENGINEER. *He has just stepped down from a cab in which he and Mrs. Watson drove down for the afternoon entertainment on the closing day of the convention.*

P. E. I. Vice-President's Report

Read by JOHN WATSON.

I BEG to report as to the condition of our society in this province. During the past two years, owing to the war, very little interest has been taken with regard to association work, but I trust that during the summer more enthusiasm will be shown by the members.

We have practically all the firms in this province in the heating and plumbing business in our association so that in that way the duties of the vice-president are very light. I am sorry we have no representatives attending the convention, and I regret very much that I cannot be present myself. Hoping that you will have a very large and successful convention.

Committees Review the Year's Work

Sanitary Committee's Report

Read for ANGUS McDONALD.

IN PRESENTING the annual report as chairman of your Sanitary Committee I do so with a great deal of regret at my inability to present same in person, but my good friend, Mr. C. R. Myers, a valued member of your Committee, will perform this duty for me.

In the first place, let us congratulate ourselves that the great war is won by Great Britain and her allies, which means so much for ourselves and the British empire as a whole in assuring continuancy of freedom and democracy for all.

In taking a survey of the plumbing trade in general I am glad to report that steady progress is being made in respect to the materials used and the improved sanitary conditions which in many places are being adopted to insure better work as well as protecting the health of our citizens. Much can be accomplished by forming local committees in municipalities, who will persist in continually keeping before their various councils the desirability of passing by-laws that will protect health as well as improving and benefiting the plumbing trade in general. This should be followed up by having a qualified sanitary engineer to follow up this work, who at all times should be available for inspection and examination work.

To show the great need of such a man, let me cite a case that occurred in the city of Stratford previous to that city adopting plumbing by-laws and inspection. A merchant built a new home and shortly after moving in his wife and daughter were taken seriously ill with typhoid fever. Although the city was fairly free from the disease, the city water was analyzed for bacteria, but the trouble was not there. The medical doctor in attendance was at a loss to account for the presence of fever and finally called in a plumber, who discovered in ten minutes the source of the trouble. The plumber who installed the work left a T Y in the soil pipe just the right height for a cistern overflow. The tinsmith connected a piece of 4-inch conductor into the soil pipe T Y.

With a case like the above to cite your committee interviewed the city council, and after much hard work, we were successful in having one of the best plumbing by-laws of any city of our size in Canada. No doubt much opposition will

be met in some places in having such plumbing by-laws passed, but at the same time there should be no trouble in convincing the authorities that there are no ulterior or selfish motives on the plumber's part, other than a health insurance in the passing of such sanitary by-laws. Inspections and examinations should be carried out to insure the best results.

The guardianship of public health under the terms of the British North American Act is like our educational system of the provincial function. The public health department of the different provinces have always been under the complete control of the medical practitioners. All municipal public health officers are physicians of this school of medicine. Municipal boards of health are absolutely under the same control. Now, while most people agree that the honorable and conscientious practitioners of medicine are, according to their theory of treatment, well qualified to do and are doing every day valuable healing work for their patients. After all, this is the work for which they go through years of training to fit themselves, why should it seem strange that they do not seem able to successfully cope with a wholly different problem involved in the question of public health? Surely it must be clear to all that the medical practitioner does not study the question of drainage, ventilating, town planning, plumbing, heating, water supply, pure food supply and so forth, which is of no consideration in their training as a medical practitioner. The main business of the medical practitioner is to treat the individual disease by means of drugs, medicines, vaccinations and inoculations.

The work of the sanitary engineer, on the contrary, has nothing to do with healing of diseases as manifested by individuals. The work for which he is trained is the maintenance of a healthful and sanitary environment, which may be achieved not by the using of drugs, medicines, vaccines or serums, given or thrust upon the individual, but through the scientific application of the different phases of the sanitarian's activities already mentioned. The sanitary engineer especially tends to reduce the fear of disease.

It must surely be apparent to those who give this work any thought that the medical practitioner should be replaced, so far as his duties to plumbing, heating, drainage, ventilating, etc., are concerned, by a sanitary engineer whose training has fitted him for this particular branch of work. Also the desirability of having enacted a uniform federal law for the province. Surely the health of the nation is of some importance to the country and should receive the thoughtful consideration of every individual who has any connection with this line of work.

The vice-president, Mr. C. R. Myers, in commenting on this report gave some interesting details of the happenings of the Stratford law courts in regard to the enforcement of the civic health by-laws which resulted in a certain pipe fitter employed in the G. T. R. shops who was not a licensed journeyman who had installed a closet bowl on a Saturday afternoon was heavily fined not only by the court, but also by his local union.

Report Apprenticeship Committee

Read by P. C. Ogilvie

AS chairman, I beg leave to submit the report of your Apprentice Committee.

We regret to say that in the last ten years very few of our Canadian boys serve out the apprenticeship of five years. It seems to be the custom of many shops not to employ apprentices, but, instead, to employ helpers, who, after working for a short time, very often pose as mechanics. Some eventually take up other work, such as stationary engineering or firemen in factories, or other buildings, and in many cases make all the repairs to the plumbing and piping in and around the building.

AT DOMINION PARK

The retiring president speaking with E. G. Brosseau of Quebec, Que., and A. H. Illsey of SANITARY ENGINEER *at Dominion Park.*

Your committee feel that it is to the best interest of every master plumber to encourage boys serving a five-year apprenticeship. This is the only way we can get first class mechanics and save our boys from becoming just ordinary unskilled laborers. The hiring of helpers should be discouraged, as it has flooded the labor market with a lot of unskilled men. In Great Britain, where many of our first class mechanics come from, the boys have to serve an apprenticeship of from five to seven years, and as far as we know the only helpers are apprentices.

We hope that this brief report will have the effect of bringing out in the discussion that will follow many good suggestions, which will help to overcome the present apprenticeship troubles. The whole respectfully submitted by P. C. Ogilvie, chairman; J. Belisle, W. Ryan, J. Saunderson, and T. Latourelle.

Report Heating and Ventilating Committee

Read by H. LAVIGEUR, Montreal.

I BEG to submit for your approval my annual report as chairman of the Heating and Ventilating Committee of your association for the year 1918-1919. I regret very much not being able to report progress, but I can certainly assure you it was not through any lack of interest or effort on my part.

In the Province of Quebec we are improving more regarding hot water heating, and I would like to advise this convention that in the City of Montreal there are several offices who are laying out plans for proprietors and public works before the master plumber knows anything about them, and then we find difficulty in doing the work, because the individuals drawing the plans complain that the plumber does not follow the plan and the result is that the master plumber is responsible for the job not going satisfactorily, and at the end it is the master plumber who pays for the mistakes of the people making the plans.

Regarding ventilation, with reference to house problems, the plumber controls this, but on public school and factory building it is controlled by a special company.

Thanking you for the honor you have bestowed on me in the past, and wishing you all a pleasant and prosperous convention, I am, yours respectfully.

Nominating Committee Report

IN submitting the report of your Nominating Committee, we wish to present clearly to the meeting that our endeavors are solely to select members for the different offices who could accept the position and conscientiously carry out the work of the office.

Our nominations are, of course, not final, and are subject to your approval or rejection. It is, furthermore, the privilege of any member to make nominations from the floor. We should be pleased to have the members avail themselves of the privilege. We should also explain that as the next convention is to take place in Ontario, we have, therefore, chosen, as much as possible, the office bearers from that province.

We feel that our selections are in the best interests of your society and hav

much pleasure in submitting them as follows:

President—F. R. Maxwell, Toronto.

Vice-President—H. Mahoney, Guelph.

Secretary-Treasurer—G. F. Frankland, Toronto.

Vice-President for Quebec—H. Lavigueur, Montreal; Ontario, T. J. Minnes, Brantford; New Brunswick, W. J. Crawford, St. John; Nova Scotia, left to the Executive; P.E.I., Thos. Johnson, Summerside; Manitoba, left to the Executive; Saskatchewan, N. B. Roantree, Swift Current; Alberta, Jas. Marr, Calgary; British Columbia, left to the Executive.

Chairman of Sanitary Committee, John Wright, Toronto; Heating and Ventilation, T. Latourelle and D. A. Bethune, Montreal; Legislative, J. T. Blyth, Ottawa; Essay, E. H. Russell, London; Apprenticeship, Geo. Clapperton, Toronto.

(Signed) Thos. Ferguson, G. F. Frankland, J. T. Blyth, H. Mahoney, J. E. Walsh, chairman.

Moved by Geo. Delaney, Montreal, seconded by H. S. Brown, Brockville, that this report be received and accepted.—Carried.

Moved by Mr. J. E. Walsh, Montreal, and seconded by H. Mahoney, Guelph, that the nominations close.—Carried.

Special Convention Committees

Credential Committee—John Watson, Montreal; T. Latourelle, Montreal; J. A. Gordon, Montreal.

Select Committee—C. D. Henderson, Brantford, Ont.; A. E. Gibbons, London, Ont.; W. J. Cracknell, Toronto.

Nomination Committee—J. E. Walsh, Montreal; G. F. Frankland, Toronto; J. T. Blyth, Ottawa; O. A. Archambault, Hull; H. Mahoney, Guelph, Ont.

Resolution Committee—E. H. Russell, London, Ont.; G. B. Grinyer, Guelph; T. J. Minnes, Brantford; F. R. Maxwell, Toronto; D. A. Bethune, Montreal.

Audit Committee—Thos. Maxwell, Toronto; Jos. Belisle, Montreal; Geo. Ross, Brockville, Ont.

Sergeant at Arms—P. C. Ogilvie, Montreal.

Official Interpreter—T. Latourelle, Montreal.

Report of Select Committee

Read by C. D. HENDERSON.

THE report of the Select Committee was presented by the chairman, Mr. C. D. Henderson of Brantford, as follows:

"Your Select Committee appointed to go over the Secretary's files beg to report as follows: It is quite evident from the amount of interesting correspondence on file from the different trade papers that those publishers offer a helping hand at every corner to our members, and we strongly urge those who are not subscribers to sign up. The cost per year fades into insignificance compared to the benefits received. It is not enough that we should simply subscribe to these papers. There are many instructive and interesting articles appearing in their columns on business and practical lines which should command careful, thoughtful reading, and along those lines your committee suggest that each subscriber arrange fifteen minutes each day for the next 12 months for the purpose of reading their trade journals, and we think that at the end of that time they will have a much better grasp of their business in general and be in a position to discuss important matters coming up at meetings and yearly conventions.

Considering the enormous amount of work in connection with the duties of the secretary of the association, your committee were much impressed with the painstaking and forceful manner in which Mr. John Watson has answered the many and varied communications from all over Canada, and we suggest that a hearty vote of thanks be tendered him for his efforts. All of which is respectfully submitted. (Signed) C. D. Henderson, W. J. Cracknell.

Recommendations and Comments by Resolutions Committee on the Various Reports Submitted

The President's Report

Clause 1—

We would strongly recommend that each provincial association deal directly with the Provincial Board of Health and endeavor to secure one national code of sanitary by-laws.

THE BANQUET

Who wouldn't attend the next convention? This is just a small portion of the happy banqueters at Dominion Park, Montreal.

Re Manufacturers—

For your observation and further action, we recommend that your provincial association deal with any grievances which may arise with the manufacturers.

Another matter for your consideration: That inter-correspondence be arranged between the different provincial associations, informing of the firms who are unfair.

Clause 3—

Re Bulk Handling—

We heartily concur in the president's sentiments regarding tendering in block, and that we do not consider it in the best interests of our business. We feel that this is too wide a field to touch at present, and we would recommend that the individual and locals can handle the same.

Vice-President's Report

Clause 1—

Referring to our vice-president's report, re clause between master and employee. In our experience we find that, in every instance, where friendly trade relations exist, our business has been greatly improved, both by better workmanship and financial gain to the employers.

Clause 2—

Re co-operation of the building industry: We would advise that all builders and employees form a Joint Conference Board and work under a system known as the Whitley Scheme, as followed out in the Old Country.

Clause 3.—That, in order to obtain the desired results, it is my opinion that the president and vice-president and secretary of the Canadian Society shall all be either residents of one city, or, at least, should be centrally located, that is, within a radius of 100 miles from the place of residence of the president, wherever he may happen to be, so as to facilitate matters whenever the president desires a conference with the other officers.

Clause 4—

In reference to the above clause we believe that our official bulletin, inserted in the trade journals, will be the stepping-stone for the furtherance of this idea.

The Secretary's Report

Clause 1—

We would recommend that all information in reference to the benefit of our association be in the hands of the Executive Committee two months prior to the annual meeting, and, if possible, a copy be sent to each section of provincial associations, to be sent out one month previous.

Clause 2—

Re Monthly Bulletin.—This Executive Committee interviewed the trade journals with a view of having inserted monthly bulletins pertaining to association news.

Provincial Vice-President's Report

QUEBEC

Clause 1.—

Re Report Organization of the Province of Quebec.—That this matter be left entirely to the Quebec Association owing to the necessity of carrying on the work in two languages.

Discounts, Clause 2.—We recommend that the matter of discounts be left in abeyance on account of the peculiar trade situation.

Clause 3.—

We would recommend that, in reference to communications which have accumulated for the past ten years in view of the changed conditions that the world has created and started a new era, be it resolved that the Canadian Society of Domestic Sanitary and Heating Engineers also start a new era from this date. Have it understood that the officers elect will not be governed by any precedent. This, we wish to state, is no reflection whatever upon our past officials, but deem it advisable to give our officers-elect a clean sheet upon which to work, so that they may apply their own initiative without being encumbered with the unfinished work of preceding conventions.

ONTARIO

The Province of Ontario is to be congratulated on the strides that they have been making, and, it is to be hoped, and we feel confident that this stride will be continued, and that they will be blessed with the real live and effective organization. They also should be thanked for their accomplishments of the past.

Central Office.—We would recommend that a permanent secretary be obtained.

Delegate to Convention.—We would recommend that $100 be at the disposal of a delegate to be appointed by this convention to attend the meeting which will be held at Atlantic City, June 17th-19th.

Goodwin Plan.—We heartily recommend the Goodwin Plan to be inaugurated when our association is strong enough to apply it effectively. We would also recommend the local and provincial associations who are now in a position to adopt this plan as soon as they become able to apply it.

Clause 3—

From the above clause we would recommend that the president and secretary be located in one place, and that we would advise that, in selecting a vice-president, a special care be given in the selection of same. Very often he is to take up the unfinished business of the president.

NEW BRUNSWICK

Report on sheet on page one is already dealt with by the recommendation re Board of Health.

Clause 2—

We also refer the above clause to your recommendation re Board of Health, also clause re manufacturers.

Clause 3—

Same as above.

Clause 4—

Re Certificates.

This committee would recommend, re the suggestion regarding issuing of certificates, that it be placed in the hands of the Executive for the furtherance of compiling details.

Clause 5—

That this clause be left in abeyance to be taken up at a future date, when our membership will warrant the consideration it deserves with the parties interested.

Sanitary Committee's Report

Clause 1—

We recommend that each provincial secretary write to their local advising the necessity of having a sanitary engineer appointed to the Board of Health of their municipality. In the event of this not being possible, to endeavor to gain the confidence of their Board of Health with a view to creating better sanitary conditions.

Chairman Heating Committee's Report

Clause 1—

Re clause of Heating Manufacturers' and Jobbing Houses, drawing plans and specifications for prospective builders. We might also say that they are giving prices in connection with the above and we would advise that this matter be taken up with them to have same adjusted.

Apprenticeship Committee Report

Subject—Apprenticeship.

We recommend that a Special Committee be formed to take the matter of the apprenticeship question up with J. Bruce of the United Association of Plumbers and Fitters to solve this question, and the United Association to appoint a like committee.

Votes of Thanks

It was moved by Mr. A. Charette, seconded by Mr. Jos. Thibeault, that a hearty vote of thanks be tendered to the newspapers of the City of Montreal, as well as the trade journals, assisting at the convention.—Carried.

A vote of thanks was then made on the motion of Mr. J. P. Blyth, Ottawa, seconded by Mr. C. E. Myers, of Stratford, to the supply man who had furnished the entertainment for the delegates.

The secretary was then informed that the delegation from Ottawa consisted of Messrs. J. P. Blyth, J. McKinley, O. A. Archambault, J. P. Band, W. H. Chapman, A. Gauthier, and W. G. Edge.

It was then moved by Ben Noble of London, seconded by Geo. Delaney, Montreal, that this society pass a resolution of condolence and that letters be sent to the families of the late W. R. J. Hughes, Thos. Lessard and Eric Selkirk.—Carried unanimously.

Moved by Mr. T. J. Minnes of Brantford, seconded by A. E. Gibbons, London, that a hearty vote of thanks be tendered to the Entertainment Committee, consisting of Mr. James Griffin, chairman, and Messrs. Walter Ryan, F. Lepine, Geo. Delaney, A. Noel, and the member of the Montreal Association for the able way in which the delegates to the 22nd Annual Convention were taken care of.

A vote of thanks was then proposed to the retiring officers on the motion of Mr. Geo. Delaney, Montreal, seconded by Thos. Ferguson of Toronto.—Carried.

A hearty vote of thanks was then proposed to the trade journals by Mr. A. Charette, seconded by Mr. G. F. Frankland of Toronto.

It was then moved by Mr. Henderson of Brantford, seconded by G. Grinyer of Guelph, that the question of trade prices be left to the Grievance Committee.—Carried.

Credential List and Delegates

We beg to report having received and examined credentials from the following officers and delegates:

President—Alex. Charette, Montreal.

Vice-President—C. R. Myers, Stratford, Ont.

Sec.-Treas.—John Watson, Montreal.

Prov. V.P., Quebec—J. E. Walsh, Montreal.

Prov. V.P., Ontario—G. F. Frankland, Toronto.

Delegates—A. E. Gibbons, London; E. H. Russell, London; Ben Noble, London; C. R. Myers, Stratford; G. F. Frankland, Toronto; F. R. Maxwell, Toronto; Thos. M. Maxwell, Toronto; G. E. B. Grinyer, Guelph; H. Mahoney, Guelph; T. Latourelle, Montreal; J. Belisle, Montreal; H. Lavigueur, Montreal; J. Ballantyne, Montreal; D. A. Bethune, Montreal; P. C. Ogilvie, Montreal; J. A. Gordon, Montreal; T. J. Minnes, Brantford; C. D. Henderson, Brantford; H. S. Brown, Brockville; Geo. Ross, Brockville; W. J. Cracknell, Toronto; J. H. Doughty, Mimico; C. H. Chapman, Toronto; Thos. E. Ferguson, Toronto; John McKinley, Ottawa; J. T. Blyth, Ottawa; O. A. Archambault, Ottawa; P. Gingras, Quebec; H. Jobin, Quebec; Eugene Matte, Quebec; J. Cote, Quebec; J. C. Huot, Quebec; C. E. Montembrault, Quebec; A. Norsau, A. Huot, O. Picard, P. Noel, J. E. Rouillard, B. Paradis, E. G. Brousseau, J. B. Morin, S. A. Daughtry, Ottawa.

Signed—John Watson, John A. Gordon, T. Latourelle.

Moved by Mr. H. Mahoney, Guelph, and seconded by H. Lavigueur, Montreal, that this report be accepted and to add the names of any other delegates arriving later.

(Continued on page 41)

EDITORIAL COMMENT

READ THE REPORTS

IN this issue of SANITARY ENGINEER will be found a complete and detailed report of the Dominion Convention at Montreal. In accordance with its policy of rendering to all those in the trade the best possible service SANITARY ENGINEER was represented at the big Montreal meeting by a member of its staff. He personally looked after the securing of all the various important reports presented from all parts of the country, prepared the summaries of the numerous discussions that took place and also secured a number of exclusive photographs. Those not familiar with the work of reporting an important convention have no idea of the amount of detail to be handled. There are hundreds of important matters in which the men in the trade in all parts of the Dominion are interested. In order that those living thousands of miles away may have as complete a report of the meeting as if they had attended it SANITARY ENGINEER has spared no expense or trouble to present to them what occurred. A close perusal of the report of the meeting is advised as most of the matters taken up, and the discussions on them, are of national interest, and will have an important bearing on the future developments of the plumbing business in Canada.

CO-OPERATION KEYNOTE OF CONVENTION

THOSE who are working with the great object in view of putting the sanitary and heating business all over Canada upon the plane to which it is entitled found a great deal to encourage them in the annual convention which was held at Montreal last week. Questions of co-operation, organization and education came up so frequently and were discussed so earnestly as to show unmistakably that the delegates from all parts of Canada are thoroughly awake to the importance of pulling together. This is as it should be. Individual effort as far as it goes is excellent, but no individual, no matter how hard he works, can begin to get the results that are possible through the co-operation of a large body of men all engaged in the same business and with a community of interests that are identical. Speaker after speaker at the convention told enthusiastically of the results that are being attained, here there and all over the Dominion by local organizations who have come to see the importance of working together. The same results on a larger scale are possible when every man in the trade in each Province works together. They are possible on the maximum scale when every man from coast to coast realizes that his interests are in common with those of every other man and all join in one big organization. There is practically no limit to the results that an organization of this kind can accomplish and more and more those who are working for the good of the whole trade are getting the vision of what can be done. Co-operation and organization will work wonders and when to these are added education, a combination is formed that is irresistible. These three things are vital needs in the trade to-day. With their coming will vanish such evils as price cutting, which is perhaps one of the worst things that has to be contended with. With education will come an end to working hard and long only to find that jobs have been handled at no profit. Other trades are solving all these problems and the sanitary and heating engineers have made the start that promises to solve them. But it means work. It means close co-operation and close co-operation means that every man must do his share. There is every indication that the men in the trade are realizing this and are awakening to their responsibilities.

WILL BE APPRECIATED

THE action of the members of the Toronto Society of Domestic Sanitary and Heating Engineers in voluntarily increasing the wages of all journeymen by ten cents an hour is one that shows a commendable spirit on the part of the employers. There was no demand for wage increases from the men who were working under an agreement that will not terminate until July 1, 1920. Naturally they were agreeably surprised when they learned of the action of the bosses and appreciated what had been done more than ever when they learned of the motives which actuated the increase. The master plumbers took action after securing a very careful and complete report regarding the cost of living. This matter was gone into thoroughly and it was decided that the men were entitled to an increase. There is a lesson in the action of the master plumbers for many other employers of labor. The spirit they have shown is one which if carried out all over the Dominion would do more to prevent labor troubles and strikes than anything else can. The journeymen plumbers of Toronto realize that they are not working for men who have no other thought than for their own selfish interests. The granting of the increase in wages and the way in which it was done will not be forgotten by the journeymen and will go a long way towards making for the best of relations.

Modern Vacuum, Gravity and Home Steam Heating

Lecture Delivered at Twenty-Third Annual Convention of the Canadian Society of Domestic, Sanitary and Heating Engineers, Held at Montreal on June 3, 4 and 5, 1919, by A. J. Dickey, Manager, C. A. Dunham Co., Limited, Toronto

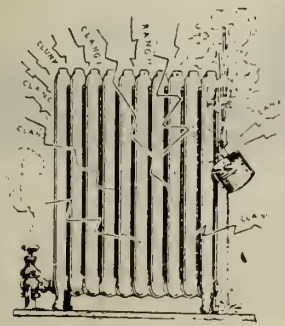
A. J. DICKEY

GENTLEMEN:—I appreciate this opportunity of addressing the members of this convention. There are many forces at work in the world to-day to bring about better conditions socially and economically. It took a force of enormous magnitude to bring the world to the realization that the old order of things must pass, and that we must bring about new conditions better suited to the age in which we live, as an enlightened and civilized people.

This being a land of free speech and thought, our problems will be solved largely through the development of public opinion, and it is necessary for leaders in each line of industry or branch of science possessed with upright ideals, to use his influence in directing this public opinion along the lines that will result in the greatest benefits to humanity as a whole.

Public opinion as applied to that branch of industry served by sanitary engineers, is an all-compelling force. Many practices in our plumbing and heating codes are in their present unsatisfactory condition because of absence of public opinion and through unscrupulous practices of men to underbid on competitive work, through use of inferior materials and stinting of the work.

Such practices can only be resorted to by men or firms that are in business to-day and are gone to-morrow. This very condition of things has brought the plumbing and heating business into some disfavor with public opinion.



A one-pipe steam radiator pictured true to life.

If the public is seized with a full understanding of the value of proper plumbing and heating requirements, then public opinion would force the development of rules and regulations that will thoroughly safeguard the public and the industry.

Education, particularly technical education, is a problem that will require the earnest support of the trade to prepare your workmen to think, reason, analyze and act correctly in the execution of his work as an artisan.

If all these qualities are possessed by your workers, they will be an enormous asset to your business.

I am very enthusiastic over technical education, and its effect on this industry for the future, if all members get behind the movement to encourage their men to take advantage of these wonderful benefits.

This reminds me of an incident that was recited to me by a contractor who was an ardent advocate of technical education.

This contractor's nephew was taking a college course, but worked at the heating trade during his vacations. His vision and understanding of nature's laws, through his college studies, filled him with enthusiasm for his task in vacation time. He was sent out as a helper on a job of heating in a residence. The steamfitter in charge of the job was sick one day and failed to show up. This lad went ahead with the work, and during the day the owner came around to inspect the work, and he was astounded with this man's technical explanation of the details of his own heating plant.

Several days later the owner called at the shop to settle his contract, and says he—"Is it necessary for your workmen to have a college education?" And the contractor replied: "Every one of my workmen is encouraged to pursue a course of study along his own particular line of work, and to keep posted on new developments in their line, as do I, by reading the trade journals."

The contractor remarked to me, when relating this incident, that this man had sent many new customers to him and he attributed it to the confidence inspired through the incident with his nephew.

A discussion of modern vacuum, gravity return and home steam heating, could be very broad in its scope, but in this lecture I wish to point out some of the salient features which are particularly outstanding in the modern type of steam heating system.

I will ask you to pardon my frequent reference to Dunham products in this lecture, but they are so closely bound up in present-day efficient steam heating that it is essential to refer to them with some explanation of the principles embodied in them.

One Pipe System

Until the last few years, heating systems, in some cases, were a rather haphazard arrangement of pipes, fittings, and boilers, and were sadly lacking in the refined specialties that provide smooth, satisfactory and economical operation.

To-day, public opinion compels improvement in heating that will produce greater economy and more real comfort. Public opinion, likewise, rebels against the use of noisy radiators or those that are likely to damage buildings and furnishings through leakage from air valves. It has likewise rebelled against the system of heating that does not permit of gradual control of steam at the radiators so that "as much" or "as little" heat can be admitted positively to the radiator as is required.

The noisy, jumping, electric arc lamp gave way to the quiet, efficient, tungsten and nitrogen lamp. Electric lighting has largely replaced gas lighting because of its quick control Just so, is the one pipe and two pipe steam systems giving way to more modern steam heating.

As you all well know, air valves on radiators are a source of a very great depreciation in building. The one pipe radiator is oftentimes very noisy owing to the pounding of the water, and especially is this true when the valve is only partially open.

If the air valve is not adjusted to a nicety, then the radiator is liable to become air bound and only a portion of it do useful work in giving off heat. I am sure that such instances are common in your varied experiences.

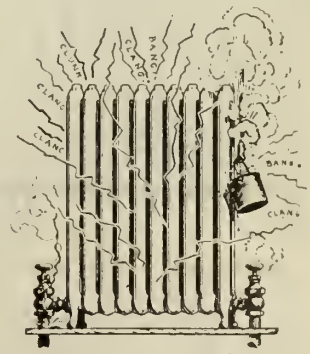
Two Pipe Radiator

In the two pipe connection to radiators, it is intended that the inlet valve will control the proper admission of steam; that the air valve will take care of all air to be vented from the radiator, and that the return pipe from the radiator will permit of the passing of water of condensation.

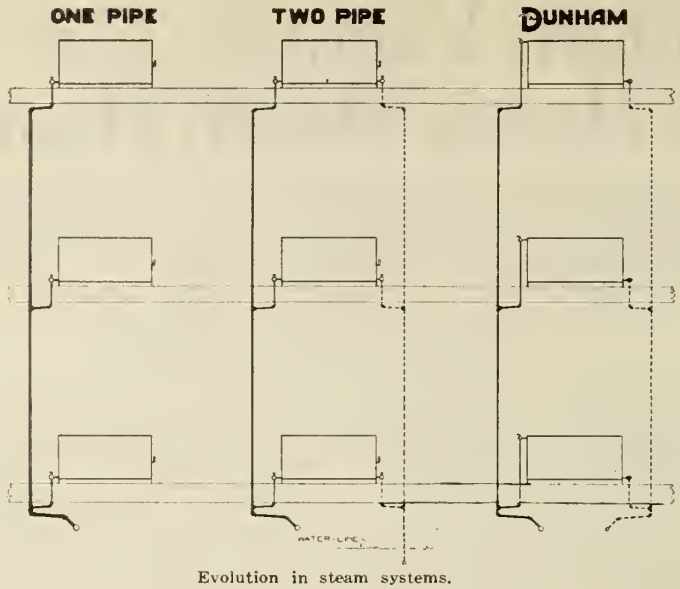
But we all know that in actual operation, when the valves are controlled by laymen, it is impossible to handle either the inlet or the return valves to accomplish their desired effect.

One Pipe, Two Pipe, Dunham

In the up-to-date steam heating system the change from the old two-pipe gravity system comes about mainly through the



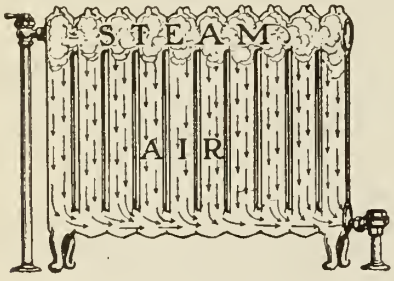
Radiator on Two Pipe System
D 5-1½



Evolution in steam systems.

application of the Dunham Radiator Trap to take the place of the hand-controlled valve at the return end of the radiator.

This trap passes air and water from the radiator, and closes when each individual radiator is filled with steam. It eliminates



Steam first entering radiator

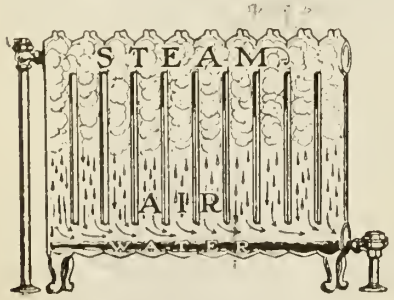
noise, air-binding, and any leakage of steam from air valves, and it provides a positive control of the heat, through the operation of the one valve—the inlet valve.

Radiator—Steam Entering

Air is heavier than steam, so that when steam is admitted at the top of the radiator, the air gradually settles to the bottom of the radiator and passes out through the trap. Circulation takes place in a natural way, and with a very small amount of pressure at the valve.

Radiator—Half Full of Steam

The amount of steam to be admitted to the radiator can be nicely and positively controlled, and as the steam condenses, the water descends and passes out through the



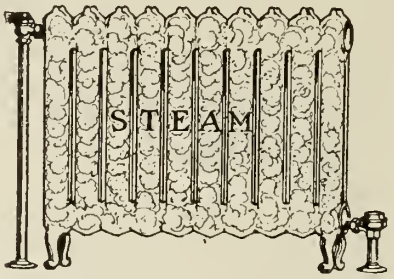
Radiator half full of steam.

return of the radiator, the same as does the air. If there is not enough steam admitted to entirely fill the radiator, then the trap remains open for the passage of air and water.

Radiator Filled With Steam

The radiator valve and the pipe supplying steam to it must be large enough to supply steam for the radiator when operating under its maximum condensing condition, and when the radiator is entirely filled with steam, the trap closes so that all steam is held within the radiator until it gives up its heat and is condensed to water.

The control of the radiator under the conditions described and which are secured in up-to-date steam heating plants, is analogous to the control of an automobile, where you can give it as much or as little gas as you want to regulate your speed. While the pipe radiator would not be unlike an automobile that must be either standing or taking a full speed supply of gas, such as



All air and water expelled. Radiator full of steam

when the radiator is shut off entirely or turned full on.

Surely, we have reached the stage in the application of steam heating where we must make use of this gradual yet smooth control of the steam supply to radiator.

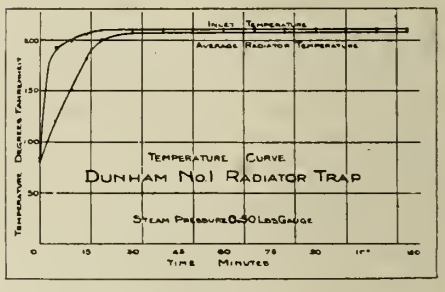
Dunham Radiator Trap

I feel that at this point I must say a few words about the Dunham radiator trap to clear up any points that may not have been made plain as to the functioning of the Dunham radiator trap as I have referred to it.

The major functions of the trap are to pass air and water and to close against steam, within the normal limits of pressure met in actual operation. Experience over the past fifteen years has proven conclusively that there is only one positive force which can be utilized successfully in a perfect radiator trap, and that is, temperature of the steam within the radiator.

The thermostatic disc in the Dunham trap contains a combination of volatile fluid, and the disc automaticallly expands under the temperature of the steam at varying pressures and temperatures, until the flat valve shuts off the discharge opening. The operation of this thermostatic disc is automatic under various pressures from 15 inches of vacuum up to 10-pound steam pressure, such as are usually met with on commercial service.

As water and air have a lower tempera-



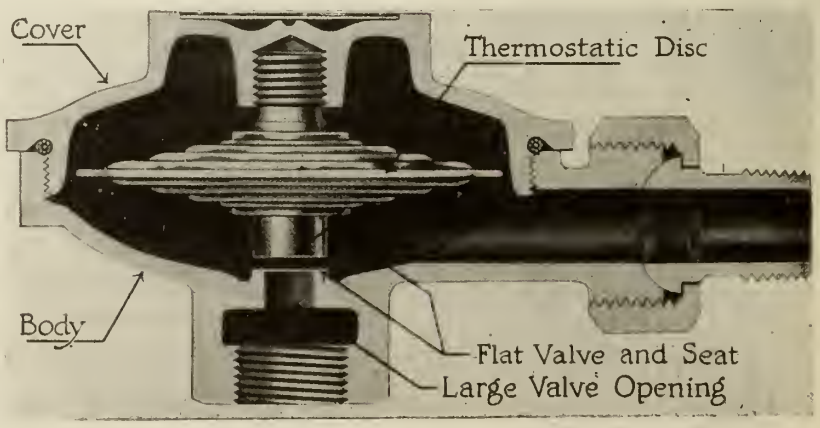
Efficiency Curve

ture than steam, they cause the gas on the interior of the disc to condense to a fluid, releasing the pressure on the interior and the valve is raised from its seat, permitting the air and water to pass out.

The Dunham trap was the first commercial thermostatic trap to be placed upon the market. It revolutionized vacuum steam heating and it overcame the wastefulness and loss of steam which was common to traps in use before the Dunham.

Efficiency Curve

This curve is interesting in that it shows on a Dunham system how nearly the temperature of the radiator approximates the temperature of the entering steam. The average temperature of the radiator is secured by thermometer readings in oil wells located over the test radiator, and if

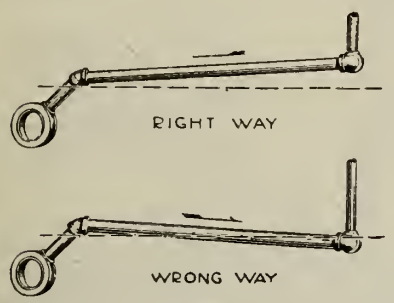


Sectional view of No. 2 trap, showing simplicity of construction.

there were any air pockets in the radiators the temperature reading would be so much lower that there would be a large difference between the average temperature reading and the temperature of the steam inlet. It shows conclusively that the trap has perfect efficiency in ridding the radiator of its air and making it do its full work in giving heat.

Spring Pipe Connections.

There are certain things that have a direct bearing upon the results secured



Common cause of trouble with steam-heating systems.

at the radiator, some of which the contractor and his workmen have a very great responsibility.

The artist in painting a picture makes it a masterpiece, because of the minutest details which are so carefully worked onto the canvas. Just so, in selling and installing a heating system, the details must be carefully considered.

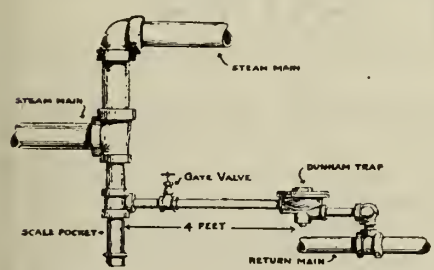
The natural tendency is for steam to raise (we see this on every hand when steam is escaping from exhaust heads in industrial plants), just so is it in the heating system.

If the spring pieces to the risers and to the radiators are not graded so as to avoid any water seals, then steam will not circulate properly to that radiator or riser.

The good workman will carefully avoid these water seals. The careless workman pays dearly for his carelessness, through tearing down the reputation of his firm.

Dripping Rise in Steam Mains

It is often necessary to raise steam mains to pass some obstruction, and wherever this is done or wherever water of condensation is likely to accumulate, suitable drip connection should be taken off through liberal drip pocket, so that the water cannot possibly interfere with the circulation of the steam.



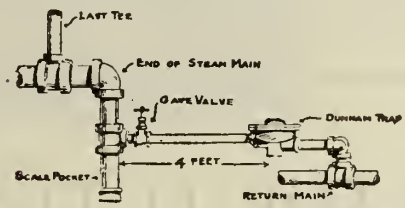
Method of Dripping Rise in Steam Main.

Drip of End of Steam Main

At the ends of steam mains the water of condensation must be taken off in much the same manner, through a liberal pocket so that the water has a chance to drop down out of the road and not interfere with the steam circulation to the last riser or radiator connection.

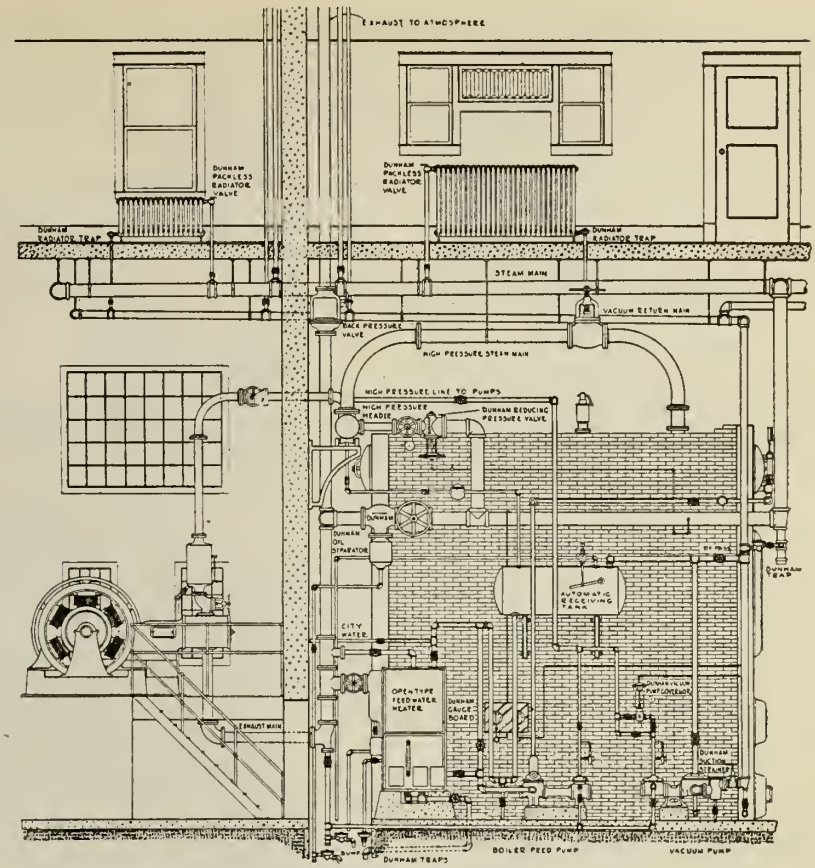
If return mains or return spring pieces are graded in the wrong direction, they will interfere with the circulation of steam just the same as though the water seal was occurring in the steam main itself or in riser.

I have known of numerous cases where poor circulation has been complained of and the trouble was due entirely to causes which I have just pointed out.



Practical and modern method of dripping ends of a steam main. Note scale pocket and trap, latter prevents steam entering return main.

Whenever a water seal occurs in any pipe, it requires that additional steam pressure must be carried on the entire system before circulation in that radiator or riser which is being obstructed by the water seal can be effected.



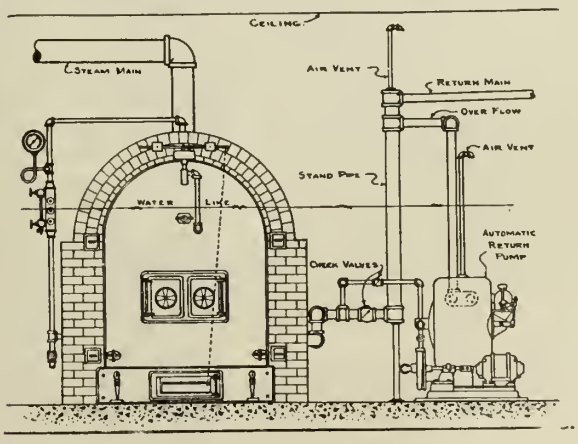
Typical Vacuum System.

Typical Vacuum System.

Vacuum heating is not new. It gets its name from the fact that some mechanical means is used for drawing a vacuum on the return piping from the heating system, which means, that the steam flows into the radiator because of the region of low pressure in the radiator due to the vacuum pump.

This type of system is particularly adapted to industrial plants where exhaust steam is available, or to any other type of building where there is exhaust steam available, or to large buildings spread over considerable area. In this type of system, the traps at the return of each heating fixture close off when the fixture is filled with steam, and the work of the vacuum pump is exerted into the farthermost radiator in the heating system, pulling the steam into the remote radiators so that the heating is positive in each unit.

Steam is circulated at very low pressure,



A Dunham return pump installation.

usually a pound or less; the control of the heat at each radiator is subject to the wishes of the tenant, and there is very great economy in this type of heating, especially where exhaust steam is used as there is 80 to 85 per cent. of the heat units remaining in the exhaust steam after it has done its useful work in the engines, pumps, generators, etc.

The positive control of the heat to the radiator on this type of system has naturally led to the development of a steam system applicable to the smaller types of buildings, yet free from so much mechanical equipment.

Dunham Return System

The Dunham return system is a two-pipe system making use of exactly the same radiator control and with free venting of the air in the boiler room through a return trap. The secret of free circulation of steam is the absence of pressure in the return piping system, with only a slight pressure in the steam piping.

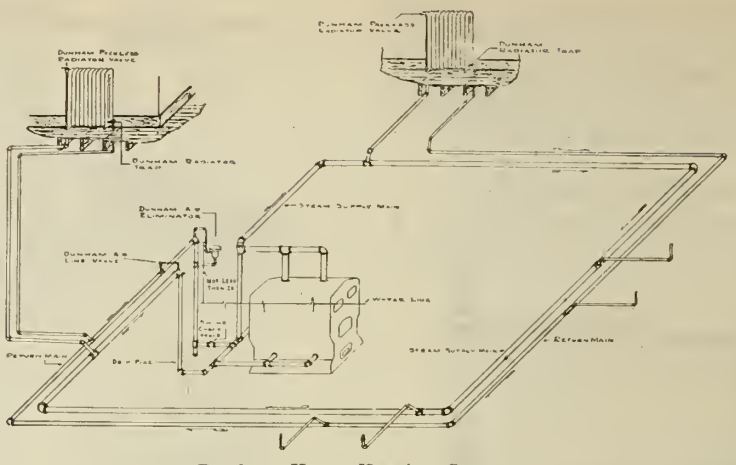
The Dunham return trap returns the water of condensation to the boiler, by equalizing the steam pressure on top of the trap with that in the boiler when the water has reached a maximum level in the trap.

With such a system as pictured on the screen, the returns from the heating system must come back to the boiler well above the boiler waterline.

In some installations, such as: schools, hospitals, clubs, etc., where ventilation is made use of, there are some returns which come back below the boiler waterline, and in such a case, an automatic electric pump would need to be used to return the water to the boiler.

The circulation of the steam through the radiator, with a small amount of pressure, accomplishes improved economy, together with more satisfactory heating, and this is what we must accomplish with our heating system to-day.

There are thousands of steam heating installations over this country that are very extravagant in their consumption of fuel, and very unsatisfactory in the effects produced at the radiator. Some of these systems are one-pipe steam systems, and others are two-pipe of the old gravity type. It is quite a simple matter to convert these old systems to more efficient and satisfactory systems, as pictured on the screen. It means the running of a return piping system, the installation of a return trap, as well as the individual traps at the radiators.



Dunham Home Heating System.

Steam heating is being applied more every day to residences and homes. It is safe, it is positive in circulation, noiseless, responds quickly, uses steam at most economical pressure, and keeps each radiator uniformly hot, permitting "as much" or "as little" supply of steam to the radiator as desired.

Dunham Home Heating.

This represents typical piping plan, and it is suggested that the steam and return main piping be run so that the radiator that gets steam quickest from the boiler would have to deliver its air the longest distance to escape from this system. This scheme balances the circuit.

The end of the steam main should be freed of its air, and all air from the system is vented through the air eliminator.

A sensitive damper control, maintaining only a few ounces of pressure, is all that is required.

I have intentionally omitted boilers, as I believe that the time has come when more attention should be given to the character of the installation between the boiler and the radiator than has been given in the past. Many boilers have been severely condemned from time to time for extravagant consumption of fuel, while the real trouble, in many cases, has been in the piping system and the methods of controlling the steam at the radiator.

I believe that the time has arrived when new methods in salesmanship will need to be used by the contractors in selling their services. They must link it up with up-to-date practices that have proven efficient and that have proven their points of merit over the old forms of heating.

Sell your clients on the basis of quality in materials and quality service. Encourage and educate your men to do their work up to the same standard. I believe that it is only by these methods can we collectively place the sanitary plumbing and heating business on the high plane to which it belongs.

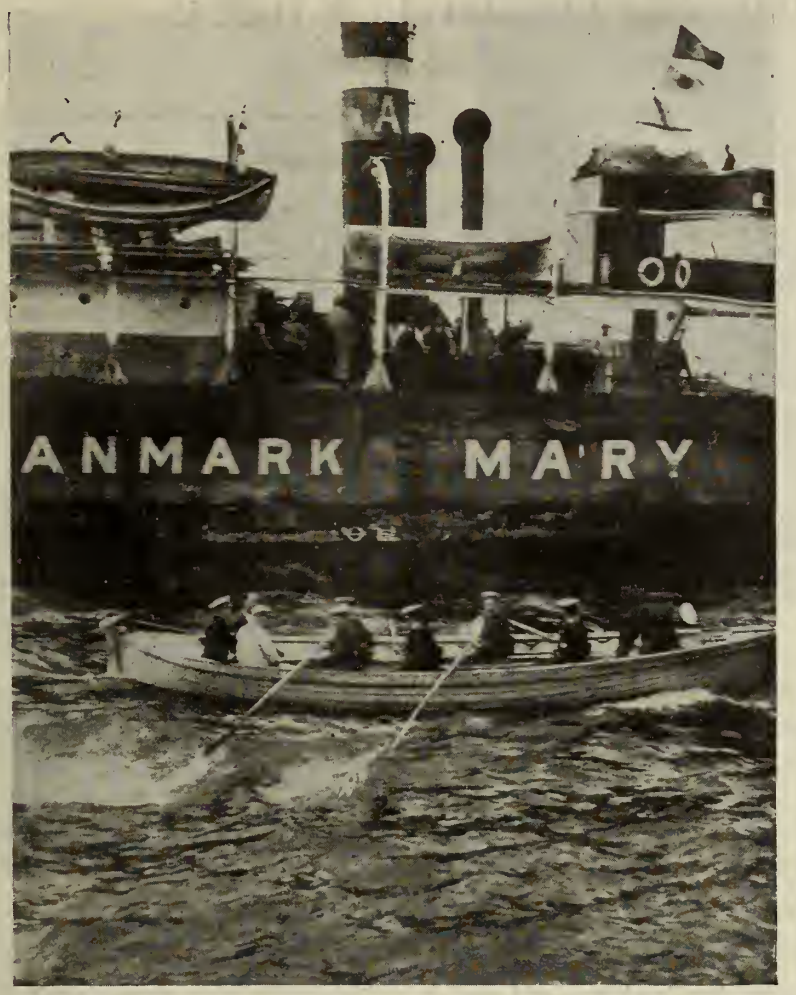
FEATURES FOR FUTURE ISSUES

DID you ever follow a load of gravel for a half mile or so to the scene of building or repairing operations and parley with a farmer to such good intent that you sold him a hot water heating system and a soft and hard water system? That is what one Brandon, Man., engineer did, and the tale of his activities in securing business forms the basis of one of the most interesting stories that has ever appeared in SANITARY ENGINEER. *"Go out after the business and get it before it reaches the competitive stage"—there is the motto of this progressive dealer. Read how he studies the farmer's proposition from all angles—let this man tell you something interesting about his display rooms—it's a good story; it will appear in the July 1 issue.*

The next issue will contain also another new series issued by the United States Fuel Administration. The first will be on "Boiler Water Treatment." These should prove decidedly interesting to many manufacturers and others who are desirous of effecting economy in the use of coal. There will be others dealing with the smaller systems employed in the home.

In an early issue it is planned to run a story of an Ontario business which has one of the handsomest and most up-to-date display arrangements in Canada. Not only from a plumbing standpoint but from the electrical end does this shop show up well, and the business they do has been built up to its present enormous proportions on a foundation of service. First quality goods, guaranteed installation and a price commensurate with the work undertaken —this is a feature story which will appear in the July 15 issue of SANITARY ENGINEER.

Current Events in Photograph



LEAVING THE RESCUE SHIP

Great interest attached to the flight across the Atlantic attempted by Hawker and Grieve. Their disappearance and subsequent rescue created consternation, followed by world-wide joy. This photo shows Hawker and Grieve (in white sweater) leaving the Danish steamer Mary in a boat from the Destroyer Woolston.

Predicts Farm Work Will Maintain Small Town Plumber ; Electrical Development Noted

THERE is a remarkable development taking place in connection with the plumbing business in Western towns. Prominent on the business cards of H. S. Stead, a Neepawa man, member of the craft, are the words, "Water pressure systems for farms a specialty."

Here is a man who has developed from the ordinary business of plumbing and heating into that of an electrical worker as well for the reason that electric water pressure systems are in demand in his district. He is doing such an extensive business among farmers that he no longer maintains an office in town but covers his territory within a radius of 80 miles by using a small touring car.

Mr. Stead predicts that within a year or two the country plumbing business will be largely maintained by work on the farms. He has personally installed seven electric lighting systems in farm houses at a cost ranging from $700 to $1,000, and at the present time has orders for four more. In connection with four of the systems already installed he has put in three electric pumps this year, and one high-pressure pneumatic pump operated by electricity. He now has the contract for an air pressure water system which is destined to feed a barn 150 feet distant from the well, and a house 350 feet distant. The drinking troughs in the barn will be automatically fed under this system.

In the case of one farmer in the Kelwood district his bill for plumbing, lighting and pressure systems will run well over $2,000. He is having installed three lavatory basins, sink and drain board, toilet and 5-foot bath, an electric lighting system, and two electric pumps, one of them for hard and one for soft water. His hot water supply will be fed from his range boiler, from his hot-air furnace and from an independent jacket heater. The plumbing system is coupled to a sewer.

This farm home will be lighted with electric lights, the farmer's wife will use an electric washer and churn, also an electric toaster and iron. The farmer will use the same power for shearing animals, for operating a sawing machine, fanning mill and other machinery.

Mr. Stead was formerly for two and a half years with the Canadian Bank of Commerce as plumbing and heating expert. He was sent to Neepawa in connection with some plumbing changes in the branch bank there, and discovered the possibilities of making money in a small town. He finds that the installation of modern power and pumping plants in one farm house ultimately leads to other orders and he has all he can do at the present time to keep up with the business offered. In the Neepawa district the farmers are rolling in wealth after a succession of bumper crops at prevailing high prices

News from Here and There

CONTRIBUTIONS OF NEWS GLADLY ACCEPTED

TRADE NOTES

Plumbing Inspector James Cluney, of Galt, Ont., has been granted six months' leave to take a course in plumbing at Toronto.

After being out on strike for twenty-five days the journeymen plumbers of Sydney, N.S., returned to work at the end of May at 65 cents an hour for an eight-hour day. The men struck for 75 cents an hour and an eight-hour day. The old rate was 52 cents an hour and a nine-hour day.

Efforts are being made by Toronto residents to get a public convenience placed in the Earlscourt district in Toronto, Ontario. The corner of Dufferin Street and St. Clair Ave. is spoken of as a suitable location.

James Brandon, of Saskatoon, is specializing in furnace installation.

Toronto's Board of Education is still considering the sanitary conditions at Kitchener, Pine, Coleman and Humewood schools. So far, however, nothing is being done. Inside conveniences at Pine school would cost $500.00, but the estimated cost is higher in the case of the others.

Wilson Bros., of Nanaimo, B.C., have a very timely ad. running in their local papers. The water situation at Nanaimo has been very bad and a house to house inspection, in an effort to remedy it, has been ordered. Wilson Brothers ask their clients that just as soon as the plumbing inspector points out the defects in their system to phone them at once.

PERSONAL

Garrett F. Frankland, secretary of the Toronto Society of Domestic Sanitary and Heating Engineers, is in Atlantic City attending the annual meeting of the National Society of Master Plumbers as representative of the Dominion Society of Domestic Sanitary and Heating Engineers.

Thomas J. Minnes, of Brantford, Ont., president of the Ontario Society of Domestic Sanitary and Heating Engineers, is spending a couple of weeks' holidays in the Adirondacks, having gone there directly after the Dominion convention in Montreal.

E. H. Russell, of London, Ont., while on his way to the Dominion convention in Montreal, was in the railway accident at Cardinal. He was riding in one of the four coaches which overturned, and while badly shaken up and bruised about the neck and arm, was able to take part in all the doings at the big meeting.

George W. Pipe, of New York, representing the Plumbers' Trade Journal, spent a couple of days in Toronto this week, after attending the Dominion convention in Montreal. He left on Saturday for Detroit.

OPENS CHICAGO OFFICE

Wm. B. Scaife & Sons, Company, of Pittsburgh, Pa., announces the opening on July 1 of a Chicago sales and engineering office at 38 South Dearborn Street, with Charles F. O'Hagan, formerly chief engineer of the company at Pittsburgh, as resident engineer and manager.

TENDERS

Tenders are now open for all work in connection with a new $250,000 medical school for the Western University at London, Ont.

Elliot Law, Preston, Ont., plans erection of a business block to cost $10,000.

The Hillcrest Housing Co., London, Ont., has commenced the erection of several dwellings, and plans to build at least fifty.

McEachren & Sons, Royal Bank Building, Toronto, are making arrangements to erect ten dwelling houses at Leamington, Ont.

Beatty Bros., Fergus, Ont., are planning to erect ten dwellings for their workmen.

Oscar Richard, Point St. Maurice, Cap de la Madeleine, Quebec, is erecting a $5,000 dwelling. Plumbing work to be let.

Thomas Carignan, Cap de la Madeleine, Quebec, is erecting a tenement to cost $8.000, and is interested in prices on plumbing goods.

Thomas Hall, 14 Jurors St., Montreal, is erecting two residences to cost $15.000, and wants prices on plumbing goods.

J. E. Peterkin, 161 Inglewood Drive, Toronto, is erecting three residences to cost $18,000, and will sublet plumbing contracts.

O. Lafortune, 181 Decarie Boulevard, Notre Dame de Grace, Montreal, is erecting two residences to cost $10,000, and will purchase plumbing supplies.

C. R. Davis, 189 Havelock St., Toronto, is erecting a $4,500 residence. Plumbing to be let.

L. H. Walton, 41 Westlake Ave., Toronto, is building a $6,000 residence. Plumbing to be let.

Adam Switzer, 216 Withrow Ave., Toronto, is erecting three residences to cost $10,500. Plumbing to be let.

W. Coulter, 505 Broadview Ave., Toronto, is building two bungalows to cost $7,000. Plumbing to be let.

F. R. Fry, 72 Windermere Ave., Toronto, is erecting a $5,000 residence. Plumbing to be let.

A. D. Grant, 5 Grenadier Road, Toronto, plans to erect duplex house to cost $11,000. Prices wanted on plumbing goods.

J. A. Shier, 1302 Lansdowne Ave., Toronto, is erecting four dwellings to cost $14,000. Plumbing to be let.

McEachren & Sons, Royal Bank Building, Toronto, have contracts for 37 dwellings for the Walkerville Land and Building Co., Walkerville, Ont., to cost $75,000. Erection of at least thirty more is contemplated.

The Ames-Holden Tire Co., Kitchener, Ont., is preparing plans for a large new factory. Prices will be required on plumbing goods.

The Royal Broom Co., Ingersoll, Ont., is preparing plans for addition to factory to cost $25,000. Prices will be wanted on plumbing work.

BIG PICNIC

Thursday, July 17, will see the resumption of the annual picnic of the Toronto Society of Domestic Sanitary and Heating Engineers. This will be the first outing that has been held by the organization for two years, as owing to the pressing needs of the war it was decided last summer not to hold a picnic. This year's outing, which will be held at Island Park, promises to be a record-breaker and every effort will be made to have at least 1,000 members of the society, with their wives and families and friends in attendance. Harry Farthing, who is chairman of the committee which is in charge of all the arrangements, reports that everything is going along splendidly and that the program will be one of the best ever put on by the society. There will be lots of sports and lots of variety.

"There will be something for everybody," said Mr. Farthing to SANITARY ENGINEER. "The program will be a winner and there will not be a dull moment. We want everybody to come out; the bigger the crowd the greater the fun. There will be events that will interest old and young, little and big, and we are looking forward to a most successful outing. The committee has worked together splendidly, and this year's picnic will be one of the best on record."

VOLUNTARY INCREASE

More than six hundred journeymen plumbers in Toronto will benefit by the action of the members of the Toronto Society of Domestic Sanitary and Heating Engineers in voluntarily granting their employees an increase in wages of ten cents an hour. The new rate, which became effective on June 9, figures out to seventy-five cents an hour.

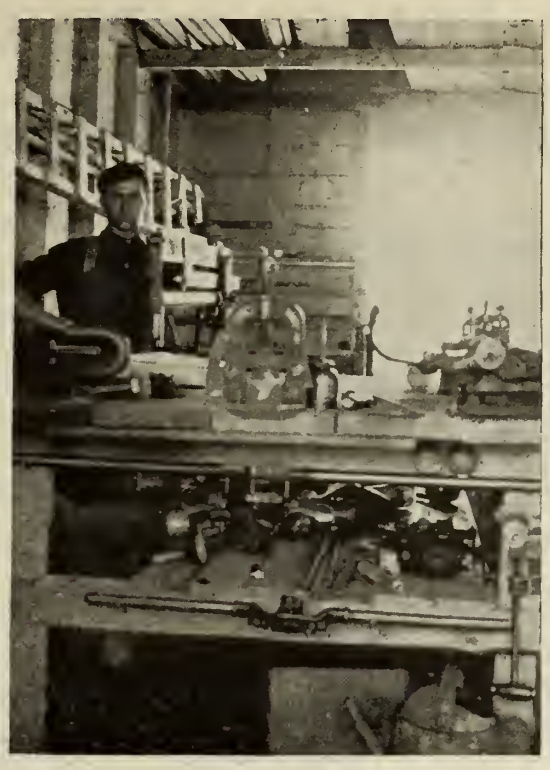
As previously stated, the increase was entirely voluntary on the part of the employers, and their action was taken after very carefully considering the increased cost of living. The journeymen have been working under a two-year agreement which will not terminate until July 1, 1920. The employers felt, however, after making their investigation into the cost of food prices, house rents, and living in general, that the journeymen were entitled to more money, and accordingly raised their wages by ten cents an hour. The investigation into the costs of living were conducted by the Agreements Committee of which Mr. Harry Waterman is chairman, and the committee's recommendation was carried without question.

SOME REAL BALL GAMES OVER ON THE DON FLATS

Some real big league stuff is being pulled off every Wednesday afternoon on the Don Flats, when the members of the various "Ender" Clubs of Toronto get out for a series of friendly games of baseball. There are real ball players, chaps who used to be ball players, but are sadly out of practice, but who will come back strong after a little practice; heavy swatters who are out to cop the batting championship from Ty. Cobb, and ambitious pitchers who unwind as many curves as a corkscrew. When everybody gets going there is a lot of real fun, and between one team and the other there should be plenty of material to make up a real team to accept those challenges that Brantford and Hamilton have been intimating are coming.

SELLING ELECTRIC PLANTS BY DEMONSTRATION

W. D. Dunlop & Co., plumbers and implement agents of Yorkton, Sask., intend taking an electric plant on the road this summer for demonstrating purposes. It is the intention to carry a full-sized 16-cell plant on a small car in order to prove personally to farmers what they are missing in the way of electric lights, a power to run small machinery, and in the installation of a water pressure system. In the last year and a half this firm has installed 20 of these plants in farm homes.



NOW GOING IT ON HIS OWN

All tinsmiths and plumbers will be interested in this picture which was taken on the day that E. Hill, of Gilbert Plains, Man., effected his emancipation from the daily grind of working for others and opened this little shop on his own account. He built the shop and equipped it and he has been busy from the start. He makes a specialty of installing tanks and furnaces as well as putting in pressure systems and doing general work in the tinsmithing line.

Catalogues and Booklets

THOMAS ROBERTSON & COMPANY, LIMITED

Thomas Robertson & Company, Ltd., of Montreal, are now sending out to the steamfitting trade a new catalogue of Sirdar boilers and radiators. These goods are manufactured for them by the American Radiator Co., of Canada, Ltd., in their Canadian factory at Brantford, Ont.

The catalogue has been printed in both the English and French language. The latter will be no doubt particularly appreciated by the steamfitting trade in the Province of Quebec, and any other parts of the country where the French language is used. Thomas Robertson & Co., Ltd., would be pleased to mail a copy to any steamfitter interested, on receipt of request for same.

CANADIAN FAIRBANKS-MORSE CO., LTD.

The Canadian Fairbanks-Morse Co., Ltd., Montreal and branches, has issued a catalogue illustrating and describing "Steam Plant Material Specifications." The catalogue is well illustrated and color work employed which adds materially to the appearance of the pages. Special headings are employed to direct attention to steam lines. boiler feed lines, boiler blow-down lines, exhaust lines and water pipe lines. A copy of this catalogue can be secured by members of the trade interested by writing nearest branch of the company.

OBJECTS TO COMFORT STATION

Parks Commissioner Chambers, of Toronto, is very strongly against the recommendation of his colleague, Property Commissioner Chisholm, that a public comfort station be erected in the vicinity of Broadview and Danforth Avenues in the Eastern section of the city. Mr. Chambers thinks that lavatories should be built when and where they are absolutely needed and he does not approve of one at that corner. When they are built, he believes they should be put underground below the street reservation.

"DUNHAM" TRADE MARK

The C. A. Dunham Company, Limited, have given notice in the Canada "Gazette" that they will make application to use the word "Dunham" as their trade mark in connection with their heating apparatus and appliances.

Burning Midnight Oil in Dauphin

E. J. Mitchell, tinsmith of Dauphin, Man., is working till midnight daily in an effort to keep pace with the orders he is receiving for furnaces and tanks. An extensive building movement has hit the farming community around Dauphin this spring, and as the various buildings go up it is necessary to "rough in" the hot water or hot air piping to the various rooms. All the business of this dealer this spring is with farmers. Since the close of winter he has already turned out 20 or 30 barrel tanks.

W. W. Hunt, tinsmith, of the same town, stated that he was unable to cope with the volume of business handed to him. He has out-of-town contracts that take him as far as Preeceville, 100 miles north. He is exceptionally busy on furnace work for new houses.

How to Figure a Seven-Piece Job

Practical Discussion Before the Ender Clubs of Toronto, by Harry Weinraub, Showing the Right Way and Wrong Way of Arriving at the Selling Price

Written by C. E. PARSONS, of SANITARY ENGINEER.

THE right way and the wrong way of estimating on a seven-piece job was the subject of an interesting and practical discussion before the "Ender" clubs of Toronto at their regular meetings this week by Harry Weinraub, chairman of the East-enders.

Mr. Weinraub emphasized the importance of checking up with great care all the material to be used. He stated that unless this is done systematically there will be many little things used of which no account will be taken, and while they cost the operator money, will be given to the man for whom the work is being done. In his own work Mr. Weinraub stated he has a special card similar to that shown in the accompanying table. On this card is listed everything that should be checked, and on each job he goes very carefully over the list and ticks off each item.

MATERIAL LIST

Soil Pipe
Soil Fittings
Vent Pipe
Vent Fittings
Galv. Vent Pipe
Galv. Vent Fittings
Local Vent Pipe
Local Vent Fittings
Thimbles
Thimbles, Hubs
Lead Waste
Lead Vent
4" Lead Bend
Sheet Lead
Caulking Lead
Oakum
Gasoline
Solder, Wiping
Galv. Water Pipe
Galv. Fittings
Lead Water Pipe
Gas Pipe Fittings
Refrigerator
Water Closet
Bath
Bath Trimmings
Basin Trimmings
Sink
Sink Trimmings
Drain Board
Plumbers' Time
Helpers' Time
Drain
Private Drain
Private Water Service
Cartage
Car Fare
Laundry Tubs
Laundry Trimming
Boiler and Stand
Stop Cock and Couplings.

Roughing Material

Taking as his basis for estimating the cost of the roughing material that the following items would enter into the figures, Mr. Weinraub arrived at a cost of $136.91.

COST OF ROUGHING MATERIALS.

	Net price.
36' of 4" soil pipe	$18.36
35' of 2" pipe	8.60
3—4¼" bends at $1.15	3.45
1—4 x 4 T Y	3.10
1—4 x 2 Y	3.10
1—4 x 2 B A fitting	2.25
1—4 x 1½ tapped tee	2.60
1—4 x 1¼ tapped tee	2.60
1—2 x ¼ bend	.55
2—2 x 2 T Y at $1.70	3.40
1—2 x 1½ tapped tee	1.60
Hanger screws	14.72
75' of 1¼" galv. pipe	15.00
2—1½ x 1¼ x 1¼ galv. tees	.80
8—1¼ galv. elbows	3.20
40' local 'v' pipe	4.00
2—3" local elbows	.75
1—2" thimble hub	.80
1—4" thimble	.50
5—1¼" thimbles	2.25
3—2" thimbles	1.35
64 lbs. lead waste	8.00
1—4 x 8 x 12 bend	3.33
1—1½ x 10 "P" trap	1.13
2—Pr. of 20 x 20 "S" lead at 32c	3.60
6 lbs. of oakum	.60
5 gals. of gasoline	1.80
20 lbs. of solder wiping	6.60
70 lbs. of calking lead	5.60
20' ½" lead waterpipe	4.60
200' ½" galv. pipe	15.00
½" galv. fittings	6.20
1—½" soldering nipple	.12
1—½" stop and waste	1.40
50' ½" black pipe	3 99
6—½" fittings	.60
Cartage	3.00
Car fare	1.00
Roughing material	$136.91

Finishing Materials

In computing the cost of the finishing materials the following items were included:

COST OF FINISHING MATERIALS

1—L.O. W.C. Outfit		$25.50
1—4' 6" enamel bath	$32.10	
1—Pr. compression cocks	3.60	
1—1½ waste and overflow	3.25	
1—Pr. ⅜ N.P. Suppl.	2.75	
		$41 70
1—17 x 119 basin apron	10.00	
1—Pr. basin cocks	2 42	
1—N.P. Supplies	2 70	
1—1¼ P. Trap	2.70	
		17.82
1—18 x 20 R.R. sink	15.05	
1—18 x 18 drain board	6.50	
1—Pr. comp. bibbs	2.75	
1—1½ 24 lead strap	2 25	
		26.55
1—16 x 24 R.R. sink	10.50	
1—16 x 16 drain board	5.50	
1—Pr. of comp. bibbs	2 75	
1—1½ x 24 lead strap	2 25	
		21.00
1—2 division cement tub	11.00	
1—1½ lead strap	1.25	
4—½ plain bibbs	3.29	
		15.54
1—30-gallon boiler	12.25	
1—Boiler stand	.50	
1—½ stop cock	.83	
1—Pr. boiler couplings	.54	
		14.12
		$162.23

Labor and Material

He obtained the cost of labor and material as follows:

Finishing material	$162.23
Roughing-in material	136.91
	$299.14
Seven fixtures at 16½ hrs. per fixture equals 115½ hrs. at 65c per hour	75.00
Labor and material cost	$374.14

The Incorrect Way

Mr. Weinraub then explained that by the old and incorrect way of figuring on the job he arrived at a selling price of $473.28 as follows:

Overhead, 10%	$37.41
Profit, 15%	61.73
Labor and material	374.14
Total	$473.28

The Correct Way

The correct way to arrive at the sale price he showed was by the divisional method as explained in the last issue of SANITARY ENGINEER, which is as follows:

Labor and materials ... $374.14.

Overhead, 15%; profit, 10%, equals 25%. 100, as basis for selling price, less 25, representing overhead and profit, gives 75 as the divisor. Dividing $374.14 (cost of material and labor) by 75, gives the selling price of $498.85.

Under the old system of figuring he showed that he would have done the work for $25.57 less than he should have charged, the difference between $498.85 and $473.28.

This selling price of $498.85 is arrived at by taking 15 per cent. as the basis for overhead. This is regarded by many of the men in the trade as too low when it is considered that in Detroit and many other American cities, not less than 30 per cent. is figured for overhead.

A hearty vote of thanks to Mr. Weinraub for his paper was passed at all the meetings of the "Ender" clubs. In replying, Mr. Weinraub stated that he was only too pleased to help the men in the trade in any way he could. He had commenced his study of doing business according to business methods as a result of an article that had appeared in SANITARY ENGINEER. It showed him that he was not making the money he should make because he was not doing business in the right way. Since that time he had been endeavoring to get on the right track, and the figures shown in the above contract, which was an actual job on which he figured, showed where some of his missing profits had been going.

RECEPTION AND ENTERTAINMENT COMMITTEE

Those upon whom the responsibilities rested for the reception and entertainment of the delegates to the Canadian Society of Domestic, Sanitary and Heating Engineers at the convention in Montreal are shown below. That they performed their duties agreeably and well was the consensus of opinion. The Reception and Entertainment Committee consisted of the following: Chairman and treasurer, R. J. Lockhart; secretary, B. J. Morris; J. Griffin, W. Ryan, F. Lepine, A. Noel, G. Delaney.

Heating and Ventilating

DETAILS

Sixth Article of Series Prepared for Readers of "Sanitary Engineer" by N. A. Kearns

Editor's Note.—This article is the sixth of a series prepared especially for the readers of SANITARY ENGINEER, covering heating and engineering practice reduced to its simplest terms. Readers will find this article on the "Details" a most interesting and illuminative one. The first article of the series appeared in the April 1 issue. Descriptions of installations made in different classes of buildings will be given, together with the method used in making the designs for these installations. It is not our purpose to give complicated formulas, but rather to present the simple rules that have been based on these formulas, in such a way that the reader will be enabled to design a heating and ventilating system without having to refer to the data given in engineers' hand-books. The author of these articles, Mr. N. A. Kearns, has designed heating and ventilating equipment for all classes of buildings in practically every province of the Dominion. Some of the buildings were such that the heating and ventilating equipment had to be installed under the most adverse conditions, whereas in other buildings the design for the heating and ventilating equipment was incorporated in the constructional drawings. The seventh article of the series will appear in the next issue.

IN the teaching of almost any branch of engineering it is the practice to first make the details easy by giving the student a broad knowledge of the first principles of the science he is studying. While his mind is being prepared to solve the most complex questions his hands are being trained by the drawing of details. If he is studying, say, the construction of a locomotive, his teacher, while drilling the student's mind to a conception of the whole machine, sets as the first task in drafting, not a complete drawing of the locomotive, but rather some simple detail, such as the firebox or one of the driving wheels. Then, when the student has completed a drawing of every detail, he makes a drawing of these details assembled in such a way as not only to illustrate the complete apparatus, but also the function of every part of it.

So, when the student of the science of heating and ventilating, attempts to put on paper a drawing showing a complete heating and ventilating plant he must be first able to draw all of the details of the equipment shown. Of course, he might, in the absence of such ability, make a general layout, showing approximately the location of certain parts of the plant, but he could not hope to make a drawing that might be followed by others in completing the installation. It is for this reason that we are now taking up the subject of some of the simpler details used in the field of gravity circulation systems for steam and hot water heating.

In the descriptions of material much may be found that to the experienced fitter is elementary knowledge, but as we believe these articles will also be read by the younger men just entering this field, we feel that the presentation of such information will be essential.

One of the principles that we have already called the reader's attention to is that where balance or equalization is the main factor. When following this principle in running mains to radiators situated in cold parts of the building and at some distance from the boiler, we make due allowance for this in laying out the pipe sizes for that part of the radiation closer to the boiler, and perhaps in a much warmer part of the building. In doing this our aim is to provide for the free flow of the heating medium, be it water or steam, and as the greatest obstruction to this flow is that offered by the frictional resistance, due to the fittings and pipes, it is easily understood why a knowledge of such details is of the utmost value to one when installing such work. Air gathering at any part of the system prevents circulation, and in the absence of provision being made for the free venting of these locations the air accumulating will not only prevent circulation through that particular part of the apparatus but will also throw the rest of the plant out of balance.

We will take up the subject of piping first, and in doing so would call the reader's attention to the fact that while wrought iron pipe is, as a rule, specified for heating mains, a great deal of steel piping is used. If the fitter's threading dies are in good shape and he finds that he is having difficulty in making clean and even threads because of the tendency of the pipe to chip, he can be assured that it is steel pipe he is working with instead of the wrought iron specified.

All pipe from ⅛ in. to 1¼ in. is butt-welded. All pipe above this is lap-welded. All pipes (except 2½ in.) up to 7 in. nominal inside diameter are slightly larger than the size specified Wrought iron pipe is also made in heavier grades than standard. The external diameter in the heavier pipe is the same as the standard pipe and the difference in the thickness of the walls is made up by the reduction of the bore.

Before pipes are put in place they should be set on end and pounded so as to release all loose material such as scale, etc., and the fitter should look through every pipe to see that it is clear. All pipes must be straight.

Elbows are used to change the direction of pipe line. Unless otherwise ordered, they are supplied with right hand threads, but they can be had with left hand threads, and also with right and left threads. Elbows, like all other cast iron fittings are provided with reinforcements. Reducing elbows are made only with right hand threads.

An elbow used at times by fitters is that known as the street elbow. These elbows are male at one outlet and female at the other.

A tee is just what the name indicates, a fitting shaped like the letter "T." In ordering a tee, state the size of the run first and then the stem. The run is that part of the tee corresponding to the top of the letter "T"—the stem is the branch. If all of the outlets are the same size, say 2 inch, all that you need do is just specify the tee as being a 2 in. tee. When ordering reducing tees, always be sure and give the size of the stem or branch last. A bull-head tee is one

(Continued on page 41)

Ventilating the Modern School

Fifth Article of Series Written Especially For "Sanitary Engineer" by N. A. Kearns—First Article of Series Appeared in April 1 Issue

THE fourth article of this series described the method of approach in designing gravity ventilating systems, and when writing that article we endeavored to draw the reader's attention to the fact that every consideration of the natural laws regarding air currents had to be taken. Gravity ventilating systems of any kind are more or less at the mercy of the elements and the careless handling of indifferent or ignorant attendants. Gravity systems have often been condemned because their designers have not always kept one eye on the weather. But as well as keeping an eye to the weather the designer should also remember that some school janitors have a confirmed dislike of extra work, such as adjusting dampers, etc., and in designing the ventilating plant, the engineer should endeavor to make it so simple that either an impatient or lazy man cannot fail in an understanding of its functions.

Now gravity systems of ventilation require the use of a certain amount of "grey matter" on the part of the janitor, and they also require careful work in their installation, so much so, that if there is the slightest doubt in the mind of the designer that either of the two elements noted might be lacking he should lay out the system for mechanical ventilation.

With the mechanical ventilating system much smaller air ducts are required than those used in the gravity systems. The smaller flues required for the mechanical system will about offset the additional expense of the fan and motor necessary.

About the only two reasons for installing a gravity in preference to a mechanical ventilating system are those found in the difficulty of always securing power to drive the fans and in the fact that there is always a temptation to keep down expense by allowing the fan to remain idle for the greater part of the time when its use is absolutely necessary.

Mechanical ventilating systems can be so designed that air can be delivered to the class rooms in exact quantities under the most untoward circumstances, and where it is necessary to condition the air by passing it through a washer, dehumidifier or a cooling apparatus, a fan is one of the essential features of the installation, indeed, indispensable.

The principles of fan engineering may be readily grasped, and while it is not our purpose to supply all the data that it is necessary to have when designing a plant of this description, we will feel that much of our work has gone for nothing if we do not at least point out the way that leads the reader to a knowledge of the basic laws governing such a system.

Our studies already have covered in a general way the standard requirements for school room ventilation. It will be remembered that 30 cubic feet of fresh air per class room occupant was the standard set for adequate ventilation. If we are in possession of data regarding the number of people that it is necessary to supply pure air for we can readiy estimate that the size of fan required will be one that will deliver the amount of air found by multiplying the number of people by 30. This requirement was taken up in the third article of this series and if the reader will refer to the data given therein it will make repetition here unnecessary.

A few years back the fans most used in the ventilating of schools were those known as the paddle wheel type. This type of fan generally had eight blades, the blades being one fourth of the diameter of the wheel with their tips inclined backward or forward and sometimes straight. They were usually inclined backwards to reduce the eddying of air in the fan.

The fans generally favored to-day are those of the multivane type. This type of fan has a great number of much smaller blades than those found in the paddle wheel type, and the tips of the blades are, as a rule, turned in the direction of the revolution, so as to increase the velocity pressure without using a large fan or running it at an excessive speed. The fan casings are so designed that the excess velocity pressure is reduced and a certain proportion of the velocity pressure converted into static pressure. This is a very superior type of fan, and requires much less room than a paddle wheel fan of a like capacity.

In selecting fans it is well to compare the catalog ratings of fans of like type with regard to the diameter of the fan wheel. As a rule the fans listed in the modern catalogue will do all of the work that they are rated for, so all that it is necessary for the engineer to do in selecting a fan is to refer to any of these catalogues for the description of a fan best meeting the conditions surrounding the installation he has in hand. Fans are made for up-discharge of air, top-horizontal discharge, bottom-horizontal discharge, angular discharge, either up or down, double width, full-housed casings, and for almost any condition that is likely to govern their setting. So in selecting a fan for the eight-roomed school under discussion, with the above data in hand, there should be little difficulty in specifying the fan most suited for the particular problem in front of us. Fans are generally driven by electric motors, and as motors are a detail of electrical engineering, it would be well for the ventilating engineer, unless he has considerable knowledge of the subject, in making his specifications, to cover only the work to be done by the fan and in specifying the motor, specify the current whether direct or alternating, and, if alternating, the frequency of the current. This will enable the fan manufacturer to supply the most suitable motor with the fan.

The following specification is given as a suggestion in the method of presenting the requirements for a simple mechanical ventilating system without such refinements as air washers, dehumidifiers, etc.

System

The heating plant shall be constructed as a one pipe, low pressure system. The heating of the class rooms, corridors, etc., is to be effected by direct radiation, disposed as per the accompanying plans. The ventilation is to be secured by means of the fan and vent coils as shown on the basement plan. Fresh air will be admitted into the fresh air rooms from the outside through suitable screened openings, provided with close-fitting valves for the control of the admission of air. This air will be heated to the desired temperature at the coils and from thence will pass by way of the galvanized iron ducts to the brick fresh air stacks shown at each class room. The tempered air will be admitted into the class room at about 8 feet from the floor line. The foul air will enter the vent stacks at the floor line. The vent stacks are to be equipped with easy acting dampers, so as to permit the closing of these ducts individually.

Gauges

The ducts of galvanized iron are to be of the following gauges:

For pipes 8 in. in diameter or equivalent, to be No. 28.

For pipes 9 in. to 12 in., or equivalent, to be No. 26.

For pipes 13 to 18 in., or equivalent, to be No. 24.

For pipes 19 to 24 in., or equivalent, to be No. 23.

For pipes 25 to 30 in., or equivalent, to be No. 22.

For pipes 31 to 40 in., or equivalent, to be No. 20.

For pipes 41 to 50 in., or equivalent, to be No. 18.

For pipes 51 to 60 in., or equivalent, to be No. 16.

Construction

All large ducts to have standing seams or to be otherwise reinforced.

Supports

Support pipes from floor joists and beams by means of metal hangers.

Bends

The drawings indicate the general direction in which the air ducts are to be run, but the contractor is to make provision for all offsets by means of long radius elbows.

Trunks

Provide and connect all trunks and branches of galvanized iron connections as may be required.

Joints

All joints in metal must be lapped in the direction of the flow of air.

Dampers

Provide volume dampers for all pipes; these dampers are to be fixed to regulate the supply of air at the time the first tests are made.

Faces

Provide galvanized iron diffusing faces set in suitable wall frames about eight feet from the floor line of class rooms indicated on the plan. Size of openings, 24x27.

Vents

There are to be no faces placed for vents. These openings are to be finished by other contractors.

Fan

Provide and set on concrete base one (1) No. — standard or equivalent fan complete, with electric motor and suitable starting device. Between fan and concrete base place cork insulation for the prevention of vibrations.

Indirect Coils

Provide and set vento radiators 4x15 x40 at 5c. 645 sq. ft,

HEATING AND VENTILATING DETAILS

Continued from page 39

where the stem is larger than the run. There are also side outlet tees, angle tees, and division tees. A type of division tee is also known as an O.S. fitting. This fitting is used quite extensively in some parts of the country. It is generally used where a better flow is required to a radiator on a branch than to a radiator above situated on the same riser.

Long turn fittings and branches are much the same as the standard fittings, differing only in having a longer sweep.

Crosses are fittings shaped like a cross, and while they are used a great deal, many experienced fitters will not use them in their practice.

Nipples are short pieces of pipe threaded on both ends and are used for short connections. They are the "close," the "short," the "shoulder," and the "long." Close nipples are threaded to allow the fittings to come almost together. A shoulder nipple is a short nipple having a piece of unthreaded pipe left at the centre. Long nipples are simply short pieces of pipe. Nipples can be had threaded right and left, as well as all left or right. Nipples can also be had with hexagon centres to take a narrow wrench, and when connecting up materials that cannot be turned they are usually made right and left.

Couplings are used for connecting up pipe. Each length of standard pipe is furnished with a coupling on one end. The standard coupling is tapped right hand at both ends. Couplings are also made, as a reducing fitting, and where pipes are reduced in size and it is required to keep one side of the run in true alignment eccentric couplings are used. Reducing couplings are made of cast iron and are only threaded right hand.

A flange is made of two flat plates bolted together, and in the larger sizes ribbed for strength. These plates have threaded openings for the connections of pipe, the two plates are bolted together and they can be bought also without bolt holes. The faces of the flanges have a gasket placed between them. These gaskets are made of various materials. A form of gasket made of heavy brown paper soaked in white lead and boiled linseed oil is sometimes used on low pressure work where the flange faces are absolutely true. Few good engineers care to use this type of gasket and prefer for the purpose a gasket made of a composition of asbestos or vulcanized rubber, sometimes reinforced with a wire framework. Corrugated copper gaskets are also used.

Bushings are used to reduce an outlet in a fitting. Caps to close the end of pipes. Plugs to close the openings of fittings. For plugs and bushings right hand threads are standard, but left hand can be obtained.

There are many other fittings used in addition to those mentioned, but the above list covers the material with which the student must first become familiar.

There are so many types of hangers on the market that we are not mentioning them in detail. The requirements for a good hanger are that it can be easily adjusted after the pipes are set in place, that it is strong and sightly, and that it allows for the contraction and expansion of the pipes which it supports. Where pipes are supported from concrete slabs above it will be necessary to have "inserts" installed when the concrete is being poured. The inserts are made to take a standard bolt to which the hangers are attached. At the same time as the inserts are being set the metal sleeves for pipes passing through the concrete should also be set in place and these sleeves should be filled with sand until such a time as they are required for the piping.

DOMINION CONVENTION GREAT SUCCESS

Continued from page 29

Proxy Vice-Presidents

V.P. for New Brunswick—James Griffin, Montreal; Nova Scotia, Walter Ryan, Montreal; P.E.I., A. Noel, Montreal; Manitoba, Geo. Delaney, Montreal; Saskatchewan, James Saunderson, Montreal; Alberta, T. R. S. Lepine, Montreal; British Columbia, C. Daoust, Montreal.

Chairman Sanitary Committee — J. Clifford Huot, Quebec.

Chairman Essay Committee—A. Landreville, Joliette, P.Q.

Credential Committee—J. Watson, J. A. Gordon, T. Latourelle.

Mfrs. Representatives and Supply Men Introduced

It was moved by Mr. H. Mahoney, Guelph, Ont., and seconded by Mr. T. H. Ferguson, of Toronto, that the order of business be suspended and that the representatives of the manufacturers and supply men be received at once and the vice-president, Mr. C. R. Myers, of Brantford, then introduced the following gentlemen to the convention:

Frank T. Rawley, Dominion Radiator, Montreal; B. J. Morris, Taylor Forbes Co., Montreal; J. L. Caron, Thomas Robertson Co., Montreal; W. J. Darling, Empire Manufacturing Co., London; J. Dalcourt, James Robertson Co., Montreal; R. Bonham, James Robertson Co., Montreal; G. Hadley, Steel & Radiation, Ltd., Montreal; W. R. Stavert, Jenkins Bros. Manufacturing Co., Montreal; J. M. Robertson, Thomas Robertson Co., Montreal; S. A. Brewer, Thomas Robertson Co., Montreal; E. Needham, Canadian Wolverine, Sarnia; R. J. Lockhart, Gurney Massey Co.; J. P. Kennedy, Dominion Radiator Co., Montreal; Joseph Devereux, Standard Sanitary, Pittsburgh; H. Lamontagne, Thomas Robertson Co., Montreal; J. R. Baxter, James Robertson Co., Montreal; T. Helliwell, Gurney Massey Co., Montreal; George McKnight, Golden Gate Manufacturing Co., Montreal; J. A. Rheaume, Dominion Radiator Co., Montreal; T. L. Robertson, Thos. Robertson Co., Montreal; A. W. Gardner, Steel and Radiation, Montreal; F. Shakell, Canadian Fairbanks Morse, Montreal; R. A. Tuggey, Canadian Fairbanks Morse, Montreal; C. F. Smallpiece, Taylor Forbes Co., Montreal; P. Largie, Warden King, Ltd.; N. Bouthilleir, Warden King, Ltd.; F. J. Wall, Mott Co., Ltd.

The trade journals were represented by the following gentlemen:

Edwin Newsome, Sanitary & Heating Journal; Hartwell Illsey, Sanitary Engineer, Plumber & Steamfitter of Canada; Cecil D. Dunn, Sanitary Engineer; A. D. Campbell, Plumbers' Trade Journal, New York; G. W. Pyke, Plumbers' Trade Journal, New York.

The question of supplying goods in connection with the housing scheme and selling to individuals outside the plumbing trade was discussed and several pertinent questions asked. Among those taking part in the debate were Mr. Helliwell of Gurney Massey Co., Mr. J. M. Robertson of Thomas Robertson Co., Mr. Needham of the Canadian Wolverine, Mr. Shackell of Canadian Fairbanks-Morse Co., W. H. Darling of the Empire Manufacturing Co., S. Brewer of Thomas Robertson Co., B. J. Morris of Taylor Forbes Co. The Master Plumbers were represented by Messrs. F. Maxwell, Toronto; T. J. Minnes, Brantford; C. R. Myers, Stratford; J. T. Blyth, Ottawa; E. H. Russell, London; George Delaney, Montreal; J. H. Doughty, Mimico; Ben Noble, London; G. F. Frankland, Toronto; H. Mahoney, Guelph; J. Thibeault, Montreal.

It was then moved by Mr. J. E. Walsh, Montreal, that a hearty vote of thanks be tendered to the supply men for coming to this convention this afternoon. The motion was seconded by Mr. G. F. Frankland and carried unanimously.

Market Conditions and Tendencies

STATEMENTS REGARDING SUPPLIES AND TREND OF PRICES

THE MARKETS AT A GLANCE

FOLLOWING on the heels of the decline in range boilers made in the United States, a similar move has been recorded here and prices during the past few days have undergone a substantial reduction.

Solder has declined 2c per pound since last issue following an easing away in the tin market. Manufactured lead products have held quite steadily and with a firmer undertone following the stiffening market on the metal.

Ingot metals show some slight changes. Tin is down about 2c per pound, copper has firmed up, lead and antimony are both firm. Little interest is shown as yet in aluminum and spelter is quiet from a buying standpoint.

Enamelware is holding firm and unchanged with a somewhat improved demand apparent. Brass goods are steady and no change is noticeable in soil pipe and fittings. The labor situation is looked upon as a factor which may tend to advance prices on this latter commodity.

TORONTO, June 12.—Lower prices have been reached on the smaller sizes of range boilers, the new quotations showing a decline of about 10 per cent. Solder is down 2c per pound and ingot metals show considerable fluctuation. Lower prices on cotton waste are looked for and a better outlook prevails in scrap metals. Business is very fair and seems to be improving.

Range Boiler Prices Have Been Reduced

RANGE BOILERS.—As a result of prices having been reduced by American manufacturers, new and lower quotations are now in effect in range boilers. While business has been to some extent affected by unsettled conditions and labor troubles it has, on the whole, been very good. Quotations are as follows:—

Range Boilers	Standard	Extra Heavy
30-gallon	$11 00	$12 50
35-gallon	12 50	14 50
40-gallon	13 50	15 50
52-gallon	20 50	25 00
66-gallon	32 00	38 00
82-gallon	40 00	47 00
100-gallon	50 00	58 00
120-gallon	60 00	67 00

Firm Prices In All Lines of Enamelware

ENAMELWARE. — With production costs remaining high and only a limited amount of business offering, manufacturers state that there is little prospect of any reduction being made in prices of enamelware. While there is a lot of good business in prospect, it is developing slowly, owing to general unsettled conditions. Prices on a few of the well-known lines are as follows:—

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Basins, flat back, 14 x 15 in.	6 45
Do., corner, 15 in.	7 15
Sinks, roll rim, 18 x 30 in.	15 05
Sinks, flat rim, 20 x 30	6 47 6 35
Do., 18 x 30	5 62 5 50
Do., 18 x 24	5 12 5 00
Do., 16 x 24	4 92 4 80
Do., 14 x 20	4 25 ....
Closets, oak tank and seat	25 50
Do., enamel iron or white vitro tank	27 50

Soil Pipe Prices Expected to Advance

SOIL PIPE, FITTINGS.—While there is apparently no immediate prospect of settlement with the metal workers who are on strike, it is generally expected that when an agreement is arrived at it will include shorter hours and higher wages. This will mean an advance in prices, manufacturers say. In the meantime, stocks in many lines are rapidly being depleted by the business that continues to offer. Quotations are as follows:—

Medium and extra heavy soil pipe, 2, 3 5 and 6 in.	20%
Medium and extra heavy soil pipe, 4 in.	25%
Medium and extra heavy soil pipe, 2 in. to 6 in.	35%
8 in. extra heavy pipe and fittings	15%

PIPE FITTINGS

Cast iron fittings	20%
Plugs	35%
Bushings	35%
Unions, ¼" to 2½"	50%
Do., ⅛", 3" and larger	45%
Dart unions, ¼-inch to 2-inch	25%
Do., 2½-inch and larger	15%
Nipples, up to 4-inch	60%
Do., 4½-inch and larger	50%
Do., running thread 4-in. and under	30%
Couplings, 4-in. and under	40%
Do., 4½-in. and larger	20%

MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittings, Class A, lb.	$0 50	$0 60
Do., Class B, lb. net	0 22	0 30
Do., Class C, lb. net	0 14	0 21

No Price Changes In Brass Steam Goods

VALVES.—Although many of the brass specialties that have to be imported from the United States have been steadily rising in price, no change has been made in the lines manufactured in Canada. Business has not been brisk and is showing the effects of the strikes in various parts of the country. Marine orders continue to come in in fairly good volume. Prices are as follows:—

Compression work, standard	50
High grade	49
Fuller work, standard	45
High grade	38
Basin cocks, No. 0 standard	40
Nos. 1 and 2	40
Bath cocks, compression	50
Bath cocks, Fuller	45
Flatway stop and waste cocks, standard.	50
High grade	47
Roundway stop and waste cocks, standard	50
High grade	47
Brass steam cocks, standard	Net List
Globe, angle and check valves, standard.	23%
Do., removable disc	22%
Radiator valves, standard	31%
Do., removable disc	Net List
Basin Cocks—	
No. 0 and 1, Fuller pattern	45
Compression	40
Quick opening	50
Globe angle and check valves, standard, medium pressure	23%
Radiator valves ,standard med. pressure	31%
Radiator valves, removable seat, medium pressure	25

Wrought Pipe Prices May Advance Shortly

WROUGHT PIPE.—Higher production costs may before long result in advances being made in wrought pipe, it is stated. In the meantime quotations are unchanged, and a nice volume of business is being handled. Quotations are as follows:—

WROUGHT PIPE

Price List No. 39, April 3, 1919

Standard Buttweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
⅛ in.	$ 6 00	$ 8 00	$.....	$.....
¼ in.	4 53	6 66	5 13	7 26
⅜ in.	4 53	6 66	5 13	7 26
½ in.	5 99	7 57	6 84	8 42
½ in.	7 53	9 66	8 68	10 81
1 in.	11 14	14 28	12 84	15 98
1¼ in.	15 07	19 32	17 37	21 62
1½ in.	18 01	23 10	20 76	25 85
2 in.	24 24	31 08	27 94	34 78
2½ in.	38 90	49 73	.....	.....
3 in.	50 87	65 03	.....	.....
3½ in.	64 86	81 88	.....	.....
4 in.	76 85	97 01	.....	.....

Standard Lapweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
2 in.	$ 27 94	$ 34 78	$ 31 64	$ 38 11
2½ in.	40 66	51 48	46 51	57 33
3 in.	53 17	67 32	60 82	74 97
3½ in.	66 70	83 72	75 90	92 92
4½ in.	88 00	113 00	107 00	132 00
4½ in.	89 00	113 00	107 00	132 00
5 in.	103 00	132 00	125 00	154 00
6 in.	133 00	171 00	162 00	200 00

MUELLER

Water, Gas and Brass Plumbing Goods

CANADA'S BEST

We wish to direct your attention to the fact that there is nothing in water, plumbing or gas brass goods practice that we do not manufacture. The test of over 60 years of producing nothing but the very best in these lines conclusively proves that we are the masters of such manufacture.

We are illustrating a few of our various lines and wish to direct your attention to the fact that—

Our 1919 Catalog A is ready for distribution.

WE MAKE:

1—Tapping Machines
2—Corporation Cocks
3—Goose Neck Connections
4—Ground Key Curb Cocks
5—Rapidac Bath Cocks
6—Rapidac Basin Cocks
7—Globe Valves
8—Drilling Machines
9—Regulating Valves
10—Meter Testers
11—Bath Supplies
12—Service Boxes
13—Basin Combinations and many other articles of highest quality.

H. Mueller Mfg, Co., Limited

SARNIA, ONT. CANADA

7 in.	175 00	224 00	211 00	259 00
8L in.	184 00	235 00	221 00	273 00
8 in.	212 00	271 00	255 00	314 00
9 in.	254 00	324 00	305 00	376 00
10L in.	235 00	301 00	283 00	349 00
10 in.	303 00	387 00	365 00	449 00

Terms, 2% 30 days, approved credit.
Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Boiler Tubes Show Little Change

BOILER TUBES.—There is very little doing in boiler tubes as yet, and the outlook seems to be that this condition will prevail for another month or so. By that time it is hoped that more activity will be manifest and jobbers indicate that they should be in a position to take care of all business from the standpoint of supplies. There is no difficulty now being shown in getting through shipments promptly. The range of prices follows:—

BOILER TUBES—	Seamless	Lapweld
1¼ inch	$27 00	$.....
1½ inch	28 00	.....
1¾ inch	30 00	26 00
2 inch	30 00	26 00
2¼ inch	33 00	28 00
2½ inch	40 00	32 00
3 inch	46 00	38 00
3¼ inch	.....	45 00
3½ inch	56 00	42 00
4 inch	70 00	54 00

Waste to Decline? Oakum Unchanged

WASTE, OAKUM.—There is a somewhat better demand for cotton waste, but this is not represented in any enormous volume as yet. The strike in Winnipeg for the past three or four weeks has certainly curtailed movement of goods to that section of the country, and consequently has cut down the volume of sales to a great extent. Prices have held without change though there is some indication of lower prices coming.

There is nothing new in the situation in oakum. There is a fair movement and quotations are well maintained at the figures shown herewith.

	Per 100 lbs.	
Best American	$21 00	$22 00
Clipper, spun	.....	21 00
Do., unspun	.....	10 50
Plumbers' spun	.....	9 50

Sheets, Plates Maintain Firm Level

SHEETS, PLATES.—Indications are that there will be no change in the market situation on sheets, as a result of the proposed tariff changes. There has been no change during the week in quotations, the figures below being well maintained. The demands of labor submitted to the employers of the steel mills in the U.S. may not be met, and that means a possibility that July 1 may see a general tie-up of the various plants. Some interests state that they cannot possibly meet the demands, so unless the two elements get together, the situation may develop rather unsatisfactorily. Stocks in the hands of jobbers are very good, and they state they would experience no hardship for a month at any rate.

Sheet copper has advanced, being quoted at 26¼c per pound, mill shipment, and 29c per pound, shipment from stock.

Solder Declines 2c; Lead Products Hold

LEAD AND ZINC PRODUCTS.—A revision downward on solder has been made this week in some quarters, the decline amounting to 2c per pound. Guaranteed is being quoted at from 33c to 37c per pound; strictly at 31c to 35c; commercial at 28c to 31c; wiping at 27½c to 30c; wire at 34c to 40c.

No change in manufactured lead products has been made, the following figures being those ruling to-day:—

Scrap Metal Shows Slow Improvement

OLD MATERIALS.—The scrap market is not improving rapidly, although there is a fair volume of business being done. The United States market is perhaps taking a little more material now than for some time past, but even yet the great bulk of this is in the form of shipments on contracts that run into thousands of tons. The scrap metal business is pretty well divided, and lines are quite clear. There is the small pedlar, with his wagon, who scours the country. He in turn sells to the man who handles about five or ten ton lots, and the next dealer is the one who takes in car lots. The clearing house is the large dealer who will undertake a contract up around 50,000 tons, deliveries to be made on a definite schedule. It is not until this last named class gets busy that the whole procession can be said to be fully engaged.

Tin Down, Copper, Lead Hold Firm

INGOT METALS.—The market continues to show a good deal of variation, but the undertone as it applies to copper, lead and antimony seems to be in a fair amount of strength. The position of tin is rather quiet. Spelter is not providing much interest. Business is fairly good and there is no difficulty in getting supplies.

COPPER.— The buying movement which has been apparent in the United States, which has tended to keep the price fairly firm, is reflected in the situation locally. The price of 18½c per lb. is a ½-cent advance and stocks are at a sufficiently high level to take care of the business which is offering.

TIN.—There seems to be only a casual interest in this metal. Supplies have been coming through quite readily, and buyers do not seem inclined to go into the market for any more than their immediate need. The price shows a decline of 2c from the figure which was quoted last issue, and now rules at 58c per lb.

SPELTER.—Production seems to be falling off, and there is little in the situation which would indicate any bullish tendencies. As a matter of fact there is really very little movement either way. The price remains at the unchanged figure of 8c per lb., which is a slight decline.

LEAD.—Greater buying activity is apparent in this metal. There is little indication that low prices, or very low prices anyway, are going to be reached. Markets in the United States are held at a pretty firm level, and the demand is really very satisfactory. There has been a considerable movement locally from all accounts, and the outlook here is pretty satisfactory. Price ranges around 6½ to 7c per lb.

ANTIMONY.—There is no indication of any easing away in the market of this metal. The price of 9c per lb. shows an advance, and there is a fair amount of activity apparent. Stocks are not heavy or ample to meet the requirements of the trade.

ALUMINUM.—There seems to be some business coming to hand on this metal, but it is still along rather restricted lines. Supplies seem to be improving somewhat, and a much better trade is looked for in the coming week. Quotations range from 40c to 42c per lb.

H. C. Crow, sales manager of the Canada Metal Co., Toronto, has left for England, where he plans to spend about six weeks.

A. E. Dyment has been elected vice-president and chairman of the Board of Directors of the Canadian General Electric Co., Limited, to fill the vacancy created by the death of W. D. Matthews.

J. R. MEADOWCROFT PASSES ON

A WELL-KNOWN and respected heating and plumbing man in the person of John R. Meadowcroft, died in Montreal on Friday, June 6, at his home, 32 Lorne Avenue.

The late Mr. Meadowcroft was a native of Montreal, having been born there 64 years ago. For upwards of 48 years he had been connected with the Garth Company, of which firm he was managing director at the time of his death. Entering the shop of Mr. Charles Garth as a boy ,Mr. Meadowcroft continued to master various details of the business and as this expanded he was given greater responsibilities. He had taken a great interest, and particularly of late years in various fire-fighting apparatus. Some of his inventions have been approved throughout America, being recognized and used in some of the larger centres.

Among other things which enjoyed his support, Mr. Meadowcroft was a member of the Montreal Board of Trade. Membership was held by him in the St. George's, Engineers' and Montreal Reform Clubs. The funeral on Monday was largely attended, attesting the esteem in which the deceased was held and the wide extent of his acquaintance.

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MORRISON'S Standard Test Gauges, Hydraulic, Altitude and Sprinkler Alarm Gauges, Combination Water Works Gauges.

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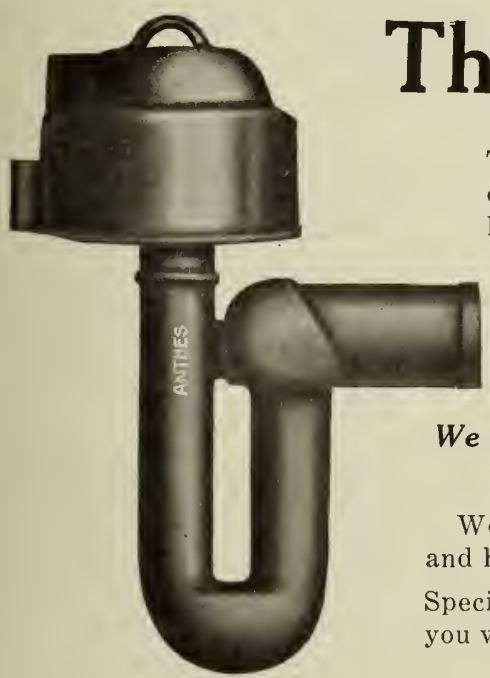

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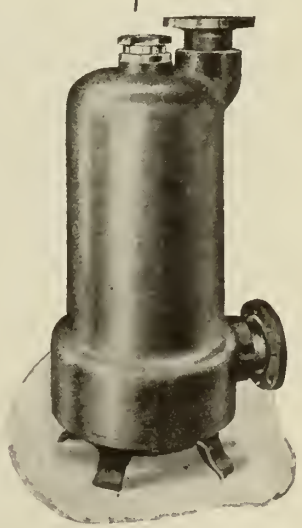

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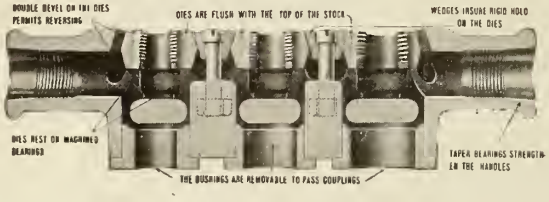
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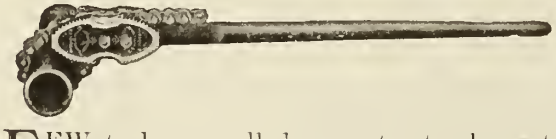

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INDEX TO ADVERTISERS

Amherst Foundry Co. ....Inside Front Cover
A. & J. Mfg. Co. 56
Anthes Foundry, Ltd. 45
Armstrong Mfg. Co., The 56

Beaton & Cadwell 54
Beaton & Corbin 56
Belanger Regd., O. 53
Borden Canadian Co. 56
Bottum Valve Co. 48

Can. Consolidated Rubber Co. .....
Inside Back Cover
Canada Metal 7
Canadian Tube & Iron Co. 50
Canadian Wolverine Co. 53
Chamberlain Desolvo Co. 3
Consumers' Metal Co. 56

Diamond Saw & Stamping Works 1
Dunham, C. A. 3

Empire Manufacturing Co...Outside Ft. Cover

Galt Brass Co. .....Back Cover and 13
Gummer, G. & W. G., Ltd. 2
Gurney Foundry Co. 55

Hause Mfg. Co., Chas. F. 56
Hoyt Metal Co. 50

Imperial City Heaters 50
International Malleable Iron Co. 52

Jardine, A. B. & Co. 6
Jenkins Bros., Limited 51

Kerr Eng. Co., Ltd.....Inside Back Cover
Katie Foundry Co. 55

Long, R. G., & Co. 55
Lord & Burnham 11

MacDougall & Co., R. 54
McIntyre & Taylor, Ltd. 53
Modern Heating and Engineering 47
Moline Heat 9
Morrison Brass Mfg. Co., Ltd., Jas. 45
Mueller Mfg. Co., H. 43
Murphy Victory Co., Limited ..... 4 and 5

Port Hope Sanitary Mfg. Co. 14

Scaife, W. B., & Sons Co. 54
Steel & Radiation, Limited 51
Standard Sanitary Mfg. Co. 10

Taylor-Forbes Co., Limited 6
Trimont Manufacturing Co..... 55
Toronto Hardware Mfg. Co. 54

United Brass Founders & Engineers, Ltd. 52

Warden-King, Ltd. 8
Wallaceburg Brass Co. 9
Wells Bros. of Can., Limited 48
Williams, J. H., & Co. 48

X Laboratories 49

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IF you've ever heard Harry Lauder sing his Scotch songs you could tell an imitation with your eyes shut.

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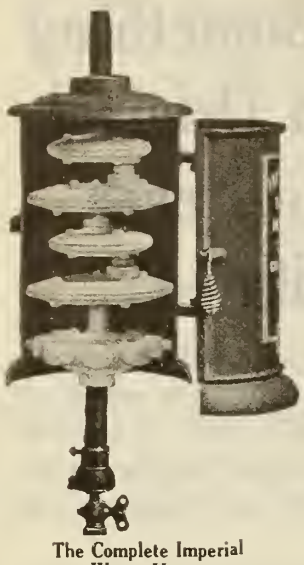

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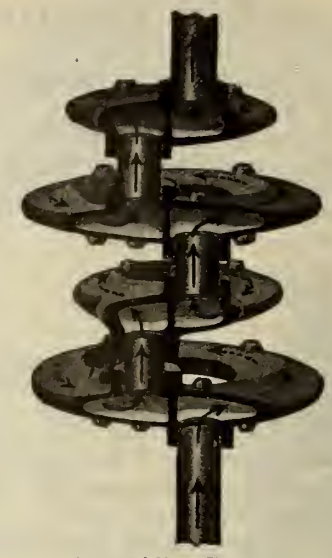

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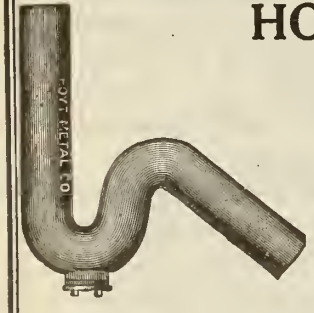
HOYT METAL GOODS ARE KNOWN

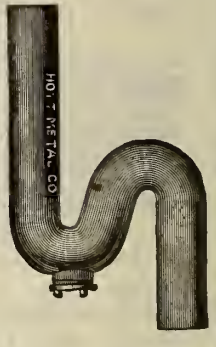
FROM COAST TO COAST



As time-savers there are none equal to our Wiping Solder, Bar or Wire Solder.

Hoyt Lead Traps, bends and waste pipe are in a class by themselves.

All our products are made to formula.



Our Mixed Metal Sales Amount To Over $5,000,000 Annually.

Write your Jobber

HOYT METAL COMPANY, TORONTO, ONTARIO

New York, N. Y., London, Eng., St. Louis, Mo.

Write Us

WROUGHT PIPE

BLACK and GALVANIZED SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

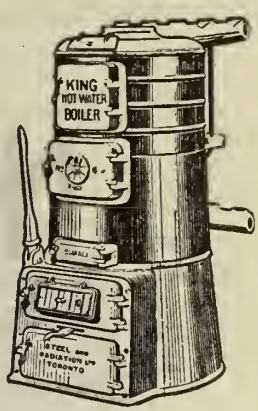
All Sizes of NIPPLES (Black and Galvanized)

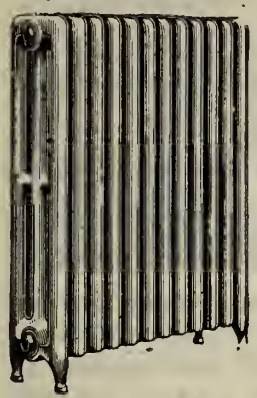
Ask your jobber for CT *Brand of Wrought Pipe*

CANADIAN TUBE & IRON CO., LIMITED, MONTREAL Works: Lachine, Can.

Urge Your Customers to Do It Now

Prices of heating systems will not drop and you will be wise to instruct your customers to have their new heating systems installed immediately.





KING HOT WATER BOILERS AND IMPERIAL RADIATORS

Science pronounces the "thin-waterway" feature of the King Boiler, the most efficient and economical principle in heating. Recommend King Boilers and Imperial Radiators—they will bring you compliments after installation.

STEEL AND RADIATION, LIMITED

Manufacturers of Hot Water *and* Steam Boilers *and* Radiators; Fenestra Steel Sash *and* Concrete Reinforcing

Head Office: Fraser Ave., Toronto **Sales Offices: Montreal, Toronto, Quebec**

A complete stock of all lines is carried at our Montreal Warehouse
Western Agents: The J. H. Ashdown Hardware Co., Ltd., Winnipeg

Why Jenkins Bros'. Valves Are Superior

Fig. 106

They are the original renewable Disc Valves. They have more imitators than all other makes of valves combined. They have kept pace with increasing steam pressures and severe working conditions. They are of the simplest design, and can be easily repaired by any man of ordinary intelligence. They are made interchangeable in every part, and any part can be duplicated promptly and inexpensively by the dealer. In the majority of cases they can be repaired by merely changing the disc without the laborious task of regrinding.

Fig. 108

They are recognized as the Standard Steam Valves in all parts of the World, and wherever there are supply houses—Jenkins Bros'. Valves will be found. The Standard of quality never changes except to improve, and while to-day there are hundreds of imitators, the sales of genuine Jenkins Bros'. Valves are constantly increasing.

Fig. 114

Catalogue No. 8 sent free on request.

Fig. 124

HEAD OFFICE AND WORKS:
103 St. Remi St.
Montreal, Canada

JENKINS BROS.
LIMITED

Agencies in all the Principal Countries of the World

EUROPEAN BRANCH:
6 Great Queen Street
Kingsway, London, W.C. 2
England

Pipe Fittings

Made in Canada

The Brand that has the Quality

M Brand Pipe Fittings, etc., give a service and satisfaction that will invariably get you re-orders and much new business as well.

A trial of the goods will prove it's claim.

CAST IRON FITTINGS

With this brand mean fittings made with iron of high tensile strength—proper proportions and correct tappings.

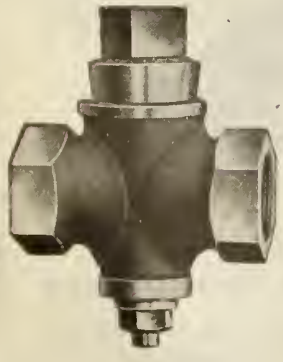
RECESSED DRAINAGE FITTINGS

MALLEABLE FITTINGS

With this brand mean fittings made of Air Furnace Refined Iron, reamed and tapped to gauge with perfect threads

Standard and Extra Heavy Flanged Fittings and Flanges. Galvanizing Malleable and Gray Iron Castings of all Kinds.

International Malleable Iron Co., Limited, Guelph, Ontario, Canada



FIVE WORKS---OVER 3,000 EMPLOYEES

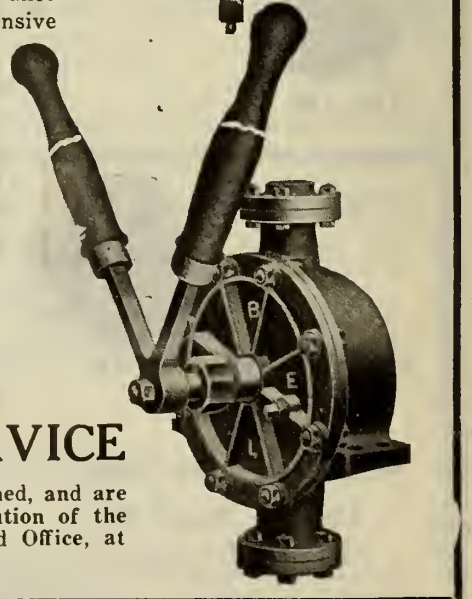
UNITED BRASSFOUNDERS AND ENGINEERS, LIMITED

EMPRESS FOUNDRY, CORNBROOK, MANCHESTER, ENG.

DURING THE WAR our Plants have been exclusively engaged on work of supreme national importance.

WITH PEACE IN SIGHT we are pleased to announce that we intend to again direct our energies to the intensive production of:—

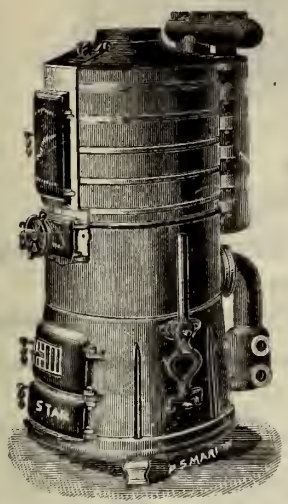
GUNMETAL and BRASS VALVES and COCKS.
STEAM, WATER and COMPRESSED AIR FITTINGS GENERALLY.
CAST IRON STOP and SLUICE VALVES.
SEMI-ROTARY PUMPS.
EXTRUDED BRASS and BRONZE BARS.
BRASS BOLTS and NUTS, STUDS and GENERAL TURNED WORK FROM THE BAR.
CAST AND MALLEABLE IRON COCKS and PIPE FITTINGS.
PRESSURE and VACUUM GAUGES.
INJECTORS and GENERAL JET APPLIANCES.
ENGINE GOVERNORS (Pickering, Proell, and Other Types).
SPRAYING MACHINES, for Insecticides and Lime-washing.
COPPERSMITHS' WORK.
"STELLA" BRAND ALLOYS: MANGANESE COPPER, SILICON COPPER, FERRO ZINC, PHOSPHOR COPPER and TIN, etc.



"UBEL" POST-WAR SERVICE

If you are interested in any or all of the lines mentioned, and are in a position to take a hand in the energetic distribution of the same, please communicate with us NOW to our Head Office, at above address.

Thousands of Star Boilers in Use requiring repair Parts



It will be a long time before folks forget the coal troubles of the last few seasons.

The principal feature of the Star Boiler is that no other round hot water boiler has any coal-saving improvement not embodied in the "Star."

Then, too, while boiler installation and repair time is here, why not stock up with Star parts, for which O. Belanger has taken over the rights and is now making?

Many thousands of Star Boilers are in use requiring these repair parts hitherto unobtainable.

Write to us at once in time to catch the season's business.

We guarantee prompt deliveries.

O. BELANGER, REG'D.
Amherst Street
MONTREAL

The Genuine
Wolverine Blunt Pattern Fuller Balls
Non-Splitting

Guaranteed to stand any degree of Hot or Cold Water

Also Tapered Pattern if you prefer.

Compounded from carefully selected materials

NINE SIZES

Complete Line of High Grade Rubber Specialties Listed in Catalog "H"

CANADIAN WOLVERINE COMPANY, LTD.
CHATHAM, ONTARIO

ADVERTISING to be successful does not necessarily have to produce a basketful of inquiries every day.

The best advertising is the kind that leaves an indelible, ineffaceable impression of the goods advertised on the minds of the greatest possible number of probable buyers, present and future.

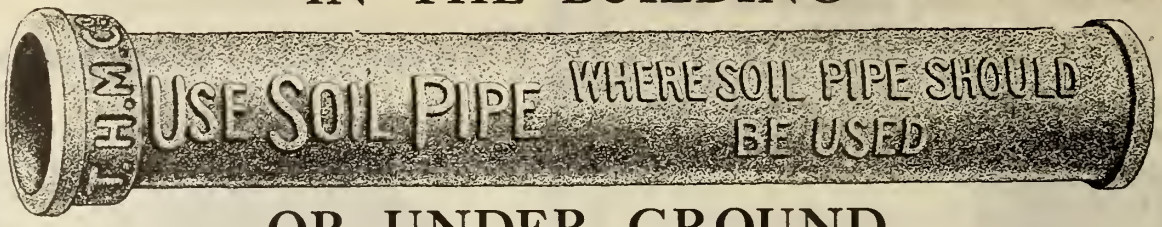
M. & T. COILS

are made of the best grey iron, free of blow or sand holes. Every coil is properly tapped with perfect standard threads and fully guaranteed. M. & T. Coils mean that perfect circulation is secured. Liberal waterways eliminate the possibility of chokage. This all means durability.

Ask your jobber, or write us direct. We can ship on short notice from stock.

McIntyre & Taylor LIMITED
TORONTO
501-3 Queen St. W.
MONTREAL
55 St. Francis-Xavier St.
WINNIPEG
156 Lombard Street

IN THE BUILDING



OR UNDER GROUND

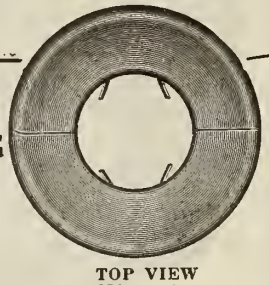
ASK YOUR JOBBER FOR T.H.M. CO. BRAND OF SOIL PIPE AND FITTINGS.

TORONTO HARDWARE MFG. COMPANY, - Toronto, Canada

WE MANUFACTURE A FULL LINE OF HIGH-GRADE RANGE BOILERS

OPEN VIEW
NO. 10-A

The CEILING PLATE that's better



TOP VIEW
NO. 10-A

THE NO. 10—A NARROW FLANGE PLATE—IS A STEEL HINGED PLATE. FLANGES ¾" WIDE. HIGHLY FINISHED. ESPECIALLY DESIGNED FOR TWIN CONNECTION "NARROW."

The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

High quality at the right price.

Gem No. 4.

Gem No. 4 Automatic Air Valve

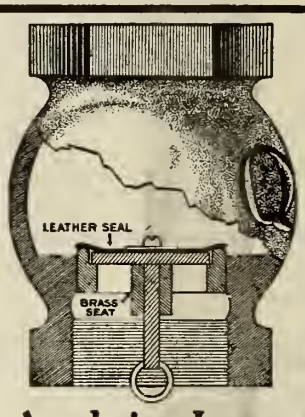
Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

Write for catalog showing our complete line of specialties.

The BEATON & CADWELL MANUFACTURING Co.

New Britain, Conn.

Eastern Agent: J. R. Devereux & Co., 358 Beaver Hall Square, Montreal. Western Agent: A. E. Hinds & Co., Chamber of Commerce, Winnipeg.



This is a "Q" Foot Valve

And it Just *CAN'T* Leak

There are more pump troubles caused by "leaky" valves than from all the wear and tear which occurs in the average life of a pump.

The "Q" valve will overcome all priming troubles, and water once raised above it, through the suction line, will not leak out.

If you want the pumps you instal to give maximum, you will require to use the only valve on the market that JUST CAN'T LEAK.

Made in sizes from 1 to 8-inch.

R. MACDOUGALL CO., LTD.

GALT., CANADA

Steel Tanks for Every Purpose

A FEW "SCAIFE" SPECIALTIES:

Air Receivers	Filters (water)	Range Boilers
Boilers—Hot Water	Hot Water Tanks	Tanks (steel)
Expansion Tanks	Hydro-Pneumatic Tanks	Water Supply Tanks

117 years old Founded 1802

WM. B. SCAIFE & SONS CO.

New York, N.Y. Office: 26 Cortland St. Home Office: Pittsburgh, Pa.

Chicago: 38 South Dearborn St.

When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER.

The Trade K–T Mark

K-T FOUNDRY

GALT ONT.

STANDARD

Soil Pipes and Fittings are of pleasing design and good finish. They look good and they are good

SPECIALS

Range Boiler Stands are adjustable to 30-35-40 gallon boilers, and you can connect dirrectly under the boiler. Inexpensive but flawless.

Your jobber can supply our goods--if you ask for them

The Wrench of 25% Greater Efficiency

TRIMO PIPE WRENCH

Two new features have been recently added to the Trimo Pipe Wrench, namely Nut-Guards, in all sizes, and unbreakable steel frames, in leading sizes.

The Nut-Guards prevent the accidental rotation of the nut while in use.

These improvements add 25% to the usefulness of the tool.

The Trimo Pipe Wrench is made with wood handles in 4 sizes, 6-in., 8-in., 10-in., 14-in. and in steel handles in all sizes, 6-in. to 48-in. inclusive.

All Trimo Pipe Wrench parts are interchangeable.

The inserted jaw in the handle can be readily replaced when worn, thus adding to the life of the tool.

Nut with Nut-Guards

Inquiries from Importers and Dealers Solicited. Send for Catalogue No. 55.

TRIMONT MANUFACTURING CO.

Cable Address: Triwrench
Code: Western Union

Roxbury (Boston) Mass., U.S.A.

BOB LONG

UNION MADE

OVERALLS

SHIRTS & GLOVES

Known from Coast to Coast

R.G. LONG & CO. LIMITED

TORONTO CANADA

Have You Taken Down Your Sign?

A prominent merchant who has made a great success of all branches of his business has said that withdrawing advertising from a good trade paper is like taking down your sign. Advertising to the trade you serve is business insurance, but premiums must be kept up or the policy will lapse.

There never was a time when the trade was keener for business information. That is why the advertising pages of the SANITARY ENGINEER are being followed so closely at the present time.

GURNEY-OXFORD BOILERS RADIATORS

FOR HEATING ANY DESCRIPTION OF BUILDING BY STEAM OR HOT WATER

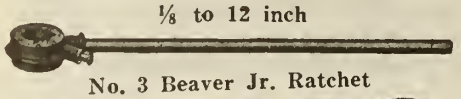
THE GURNEY FOUNDRY CO. LIMITED

TORONTO MONTREAL CALGARY WINNIPEG VANCOUVER

BEAVER TOOLS

For Easy Cutting

⅛ to 12 inch



No. 3 Beaver Jr. Ratchet

THE pipe-threading problem is readily solved when **Beaver Easy-Working Die Stocks** are used. They cut quicker and save labor, time and money.

They eliminate troublesome bushings and the bother of changing dies.

Beaver Threaders are easily adjusted. Simply "move the handle—that's all."

Beaver Tools are absolutely guaranteed. The user and the dealer are both protected.

Write us for descriptive circular and prices.

The Borden Canadian Company
110 Church St. - - - Toronto, Canada

GENUINE
ARMSTRONG STOCKS and DIES

Hingd Pipe Vises *Pipe Cutters*
Pipe Threading Machines

—MANUFACTURED BY—

THE ARMSTRONG MFG. Company
317 Knowlton Street, BRIDGEPORT, CONN
248 Canal Street, NEW YORK

SAVE YOUR COUPLINGS

Write us what you have of the various sizes, either in pieces or pounds, and we will make you a cash price on them.

The A. & J. Mfg. Company
559 West Lake St. Chicago, Ill.

Second-Hand Pipe

1-2" to 4"

Black and Galvanized

Send us list of your requirements

Consumers Metal Company, Limited
14 St. John Street, MONTREAL
Works: LACHINE, QUE.

"BC" COMBINATION COLD ROLLED STEEL Floor and Ceiling PLATES

Carried by the leading supply houses

No. 15

Puts just the right finish on that heating job

Send for catalog of complete line of "B. & C." goods.

No. 1 Valve

Stock carried by our Canadian Representative
W. H. CUNNINGHAM & CO.
183 Church Street
Toronto, Ont.

No. 16

No. 17

The Beaton & Corbin Mfg., Co.
Southington, Conn., U.S.A.
The Old Original Company

"HAUSE" PIPE JOINT CEMENT

For steam, water, air, oil, gas, gaskets, etc. The cement that cements. Sets like gum. Allows no leaks.

The Great Value of "HAUSE PIPE JOINT CEMENT" lies in its peculiar chemical properties which permits of its hardening and expanding after the joints are made up. In making up joints it has the same effect as a lubricant on the best graphite, and while the joints may be made and broken readily, a perfectly tight joint is maintained at all times. Comes in 1-lb., 5-lb., 15-lb., 25-lb., 50-lb. cans, 100-lb. barrels. Manufactured in ready mixed and powder form. Ask your jobber for prices, or write us direct.

Made in Omaha, Neb., U.S.A.

Manufactured in Ready Mixed and Powder Form.

Canadian Distributors:

Empire Manufacturing Co., Limited
LONDON and TORONTO

WORTH WHILE PUBLICITY

The general tendency in Canada is towards selling high-grade goods. There never was a time, in the history of the country, when all branches of the Canadian trade were more interested in securing all possible information regarding products they can recommend and guarantee to their customers. Advertisers in SANITARY ENGINEER reach the cream of the trade in all parts of the Dominion.

"Canadian" Plumbers' Rubber Goods

Plumbers and Sanitary Engineers, who know the market, find that the Dominion Rubber System Supplies give absolute satisfaction. That means satisfied customers. That is why "CANADIAN" Flush Balls are so much in demand. They can made right and fit tight.

"CANADIAN" Furnace Bulbs are always dependable and much cheaper than pumps—no valves or springs to get out of order.

Ask your jobber for the "CANADIAN" brand—supplied through Dominion Rubber System branches

Dominion Rubber System Service Branches

are located at:

Halifax,	Toronto,	Fort William,	Edmonton,
St. John,	Hamilton,	Winnipeg,	Calgary.
Quebec,	London,	Brandon,	Lethbridge
Montreal,	Kitchener,	Regina,	Vancouver
Ottawa,	North Bay,	Saskatoon,	Victoria.

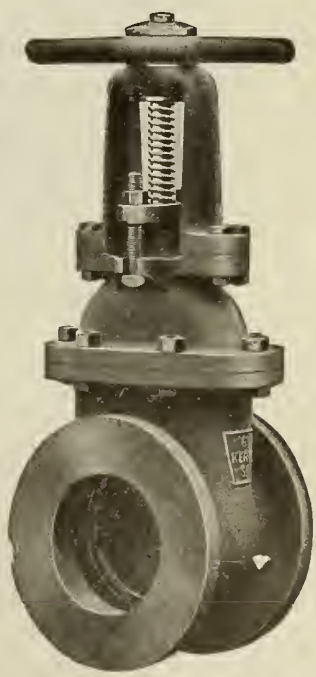
CANADIAN CONSOLIDATED RUBBER CO. LIMITED
DOMINION RUBBER SYSTEM
AND ASSOCIATED COMPANIES

There Are Lots of Gate Valves

Advertised and Sold

but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.

Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.

Approved by the Fire Underwriters' Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

EVERY FITTING TESTED

Think of it!

Twelve Years without a leak

EVERY TANK GUARANTEED

MADE-IN-CANADA

VitrO Tanks that were installed ten years ago are still going strong without sign of the first leak.

Surely this fact is sufficient evidence that tank troubles have been successfully overcome.

In the construction of the VitrO all chance of trouble is avoided by eliminating those features which in other tanks cause trouble. The VitrO is all in one piece with no joints to open up and no linings to leak.

Installing VitrO No-trouble Tanks is a mighty profitable way of building a permanent, satisfactory business. It gains for you a reputation for reliable, honest work that is well worth while.

OUR GUARANTEE

A new Tank will be given to replace one that at any time proves defective from either material or defective workmanship.

Write us for a **VitrO** Catalogue.

Join us in our success by specifying VitrO No-Trouble Tanks when placing your next order of goods.

Write Us or Write Your Jobber

GALT BRASS CO., LIMITED

GALT :-: CANADA

Sanitary Engineer

Plumber and Steamfitter of Canada

VOL. XIII. PUBLICATION OFFICE, TORONTO, JULY 2, 1919 No. 13.

Judge a Building By Its Plumbing

THIS advice offered prospective tenants and house-buyers is sound advice.

If every prospective tenant or purchaser of a house made a thorough inspection of the sanitary arrangements in the house, instead of paying so much attention to the outside appearance, and usually so little attention to its appointments, sanitary engineers would be overwhelmed with work.

But they don't—

Therefore, it behooves the sanitary engineer to advise.

If the sanitary arrangements in his client's property are several years old—they are out-of-date. They need replacing—or, to say the least, they greatly need repair and replacement of parts.

There is going to be a lot of work of this nature done this year—and the sanitary engineer should be equipped for sudden calls. He should be fully supplied with information regarding the most up-to-date appliances. He should have us at his elbow. We can be of great service to him.

Our engineers are ready to advise him. Write us and let us place our facilities, our equipment, and complete stock of everything in sanitary supplies at your disposal. It will help you greatly.

EMPIRE MANUFACTURING CO., LIMITED

LONDON AND TORONTO, CANADA

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While

A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for BEAVER BRAND CAST IRON ENAMEL WARE

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

ONTARIO:
Monarch Brass Mfg. Co., 71 Brown St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes, 120 Lombard St., Winnipeg

The Publisher's Page

TORONTO JUNE, 1919

SANITARY ENGINEER is one of the fifteen MacLean papers.
The MacLean papers, being editorially efficient, command the confidence of their readers, thus making them most effective as a factor in well-planned advertising campaigns.

Complete List of Publications

TRADE NEWSPAPERS

Hardware and Metal	Canadian Grocer	Dry Goods Review
Men's Wear Review	Bookseller and Stationer	Sanitary Engineer

TECHNICAL PAPERS

Canadian Machinery	Canadian Foundryman	Marine Engineering
Power House	Printer and Publisher	Motor Tractor

MAGAZINES

MACLEAN'S MAGAZINE FARMERS' MAGAZINE

Financial Post—*Weekly commercial newspaper.*

The MacLean Publishing Company, Limited
143-153 University Avenue - - TORONTO

Largest Publishing House in Canada

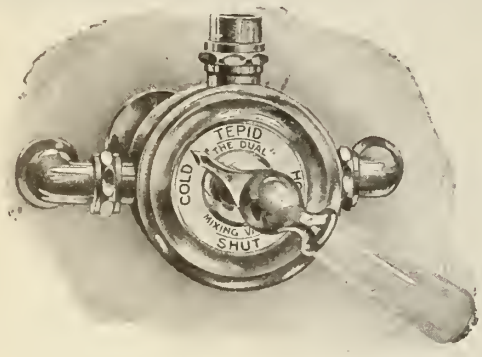
SANITARY ENGINEER, July 1st, 1919. Published the 1st and 15th of each month at 143-153 University Ave., Toronto, Canada, by The MacLean Publishing Co., Ltd., Vol. XIII., No. 13. Yearly subscription rates: Canada, $1.00; United States, $1.50; Great Britain and the Colonies, 4s. 6d.; elsewhere, $2.00. Entered as second-class at the Post Office Department, Ottawa. Entered as second-class matter July 1st, 1912, at the Post Office at Buffalo under the Act of March, 1897.

G. & W. G. GUMMER, LIMITED

EFFINGHAM BRASS WORKS,

And at
9 Fenchurch St.,
London

ROTHERHAM,
ENGLAND



"Dual" Mixer

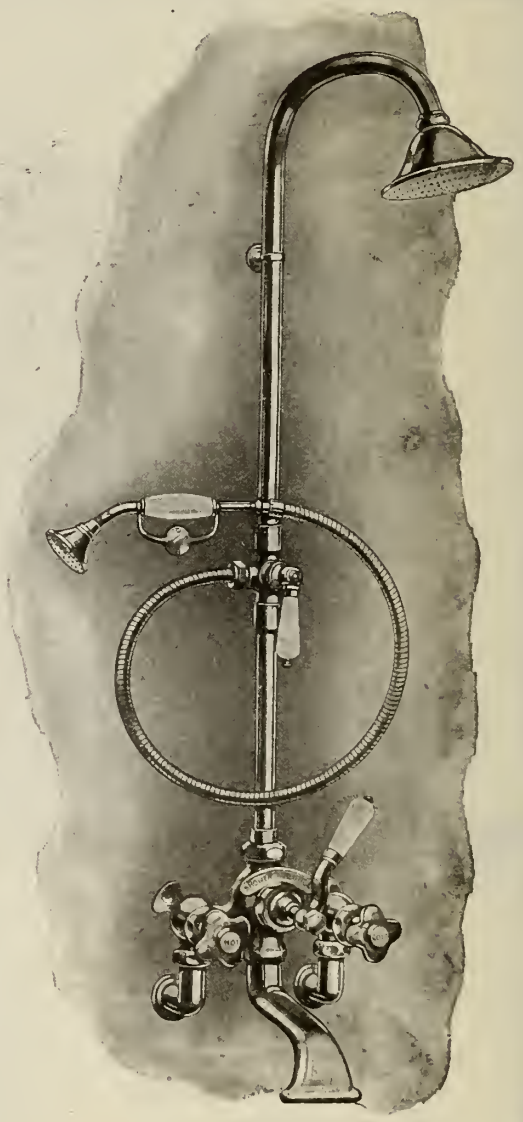
A valve that really mixes Hot and Cold Water, and maintains a uniform mixture.

For ease of operation, simple construction and easy installation, it has set a new standard of efficiency.

Cold Water must be turned on first, no possibility of scalding.

Made in several forms for showesr, Sprays, Operating Rooms, etc.

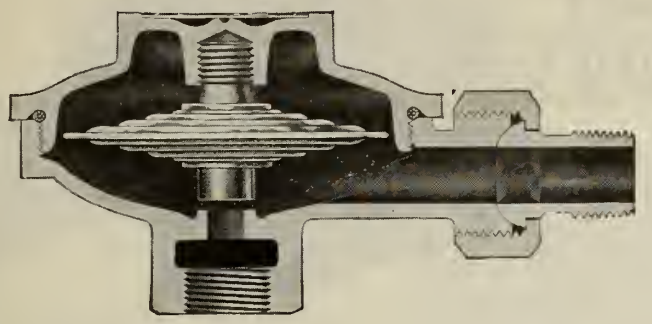
At the well-known works of Messrs. Brunner, Mond & Co. these valves provide baths for 2,500 employees.



G. & W. G. GUMMER, LIMITED

Manufacturers of every description of

Engineers,' Plumbers' and Sanitary Quality Brassware



Inside Facts About Heating the "Dunham Way"

The DUNHAM HEATING SERVICE

The Dunham Radiator Trap is distinctive in the simplicity of its construction.

It is this fact that makes a Dunham Heating System so simple, yet so efficient.

The Dunham Radiator Trap is the heart of Dunham Heating. It gets rid of all air and water from the radiator, but holds the steam in until every last bit of heat is given off. It does this automatically—no noise—no air valves on the radiators.

Dunham Heating is standard where efficient and economical operation is desired.

Dunham Heating Service, in advising on heating problems, is given without obligation.

Complete details on request.

C. A. Dunham Co., Limited
TORONTO, ONT.

Halifax Winnipeg Calgary
Ottawa Vancouver Montreal

THE MODERN HEATER

Hot Water Heating by Steam

We furnish plans and specifications for Heating and Ventilating Schools and Public Buildings. Central Heating Plants for Groups of Buildings. Laundry and Kitchen Equipment.

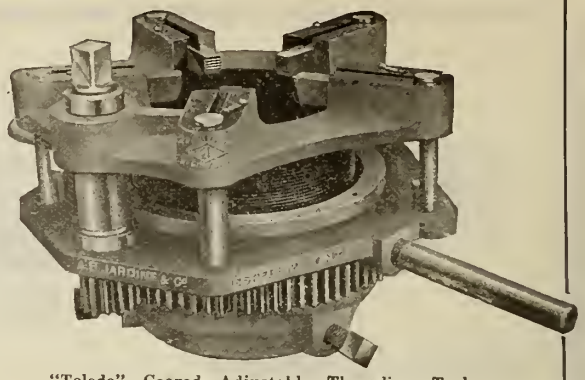
Some of the installations we have made, list of many others on application :

Grey Nuns Mother House, Montreal.
St. Vincent de Paul Hospital, Brockville, Ont.
Adam Clark, Hamilton, Ont.
Hagens Convent, Halifax, N.S.
Orphanage St. Joseph, Winnipeg, Man.
Grey Nuns Mother House, Ottawa, Ont.

We solicit enquiries from Architects

Modern Heating & Engineering Co. Limited
83 Bleury Street, Montreal, Que.

JARDINE and TOLEDO PIPE THREADING TOOLS



"Toledo" Geared Adjustable Threading Tool No. 2½. Capacity 2½ to 6 in. inclusive. Weight, 120 lbs.

THE ratchet feature of Jardine and Toledo Tools permits their being used to thread pipe which is already in place, no matter how awkward it may be to reach. The Jardine and Toledo have no cams or jim cracks to get out of order; and the dies only cut with the mouth of the cutter. Also, as the tool advances on the thread the dies open out so as to make the proper taper. This means there is no friction on the pipe and every ounce of strength is used in making the cut, so saving time and labor. These are only a few of the valuable features of these tools.

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Sole makers of "Jardine" Pipe-Threading Tools.
Sole licensees to manufacture and sell Toledo Pipe-Threading Tools in Canada.
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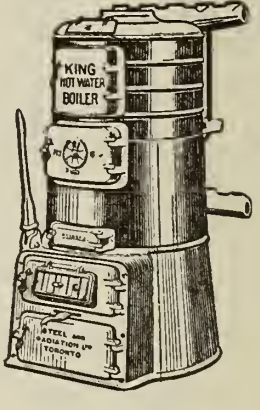

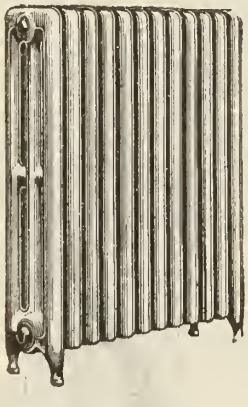

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Advise your people to install Heating Systems now as the price will not be lowered, and the best work can be guaranteed on early contracts.

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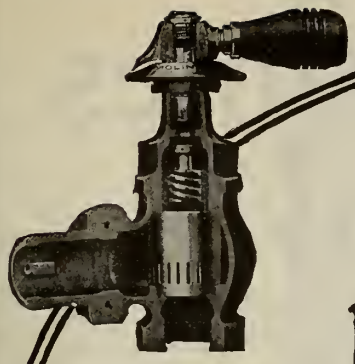

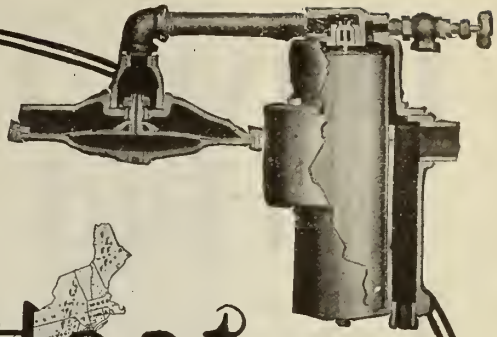

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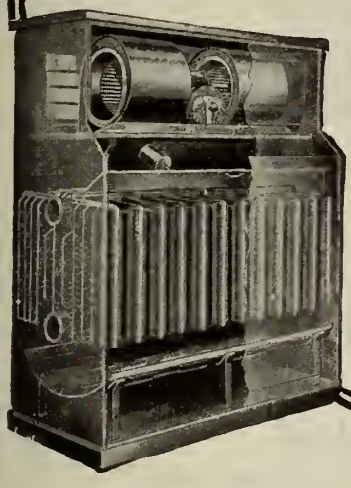

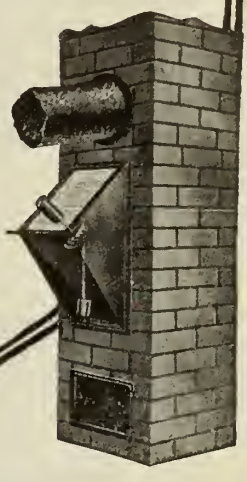

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"Heat without dirt"
"Heat without odor"
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Have The Maritimes Had Fair Play?

THE Maritime Provinces did not enter Confederation very willingly and it may surprise people in other parts of the Dominion to learn that at the present time the people of New Brunswick and Nova Scotia are not altogether pleased with the results of the bargain. There is a distinct feeling among them that the advantages of Confederation have gone to the other Provinces. In the course of an article in the July issue of MACLEAN'S MAGAZINE, Thomas M. Fraser explains why this feeling has grown and the basis for it.

This article was written for the purpose of letting the other provinces know that the feeling exists but it will be of intense interest to people in the Maritimes. Be sure to read it—"The Spirit of the Maritimes."

"The Land of National Leaders"

An article on the political aspect of the Eastern Provinces and the achievements of their leading statesmen.

"Guarding Our Coast Line"

An extremely interesting description of the measures that were taken to patrol and guard the Atlantic seaboard during the war.

Bonar Law, the man from the Maritimes, who has been the able lieutenant of Lloyd George at all crises in Great Britain, appears on the cover in a handsome three-color reproduction.

Other Big Features of the Number

"With the Snowball Brigade"

By Captain Louis Keene

Just back from Siberia—Captain Keene tells some sensational and intensely gripping things about conditions in that country which the Canadian forces are helping to stabilize. It is a record of international complications, strange atrocities and almost unbelievable living conditions.

"The Three Tommies"

By Robert W. Service

A war poem of unusual strength.

"Solving the Problem of the Arctic"

By Vilhjalmur Stefansson

The fourth instalment of his remarkable story of the five years he spent in the north for the Canadian Government, appearing exclusively in MACLEAN'S.

Three Magnificent Stories

The best fiction obtainable is found in this issue: "Owners Up," a race horse story by W. A. Fraser; "His Majesty's Well Beloved," by Baroness Orczy; "Bunkered," by Allen C. Shore.

The Review of Reviews

Here are a few of the articles in this splendid department chosen as the best published during the past month in all magazines:

Finding Husbands For Three Million Women.
Will England Become an Agricultural Country?
Germany Can be Prosperous Under the Peace Terms.
The Woman Who Wrecked the World.
The Great Lama Rides in Motor Car.
Strange Personalities at Paris.
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"Perfection" Built-in Baths

Made in One Piece Enamelled All Over

These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in-Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners meaning bathroom sanitation.

Made in 5 and 5½ foot sizes.

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Cast Iron Flanged and Drainage Pipe Fittings

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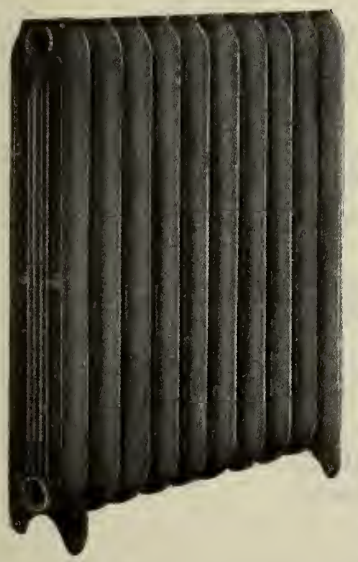

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They are made in every useful variety of shapes, sizes and designs—to fit into handy places about a house—to meet the demands of the area to be heated—and to correspond, in pattern and finish, with the decorative scheme adopted for each particular room or hallway.

SCREWED NIPPLES

The sections of "Sovereign" Radiators are joined together by screwed nipples. These make an absolutely tight and unleakable joint. Every radiator is tested under hydraulic pressure before leaving the factory.

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Large, smooth connections between the parts of a radiator ensure an easy flow and regular distribution of water or steam. The "Sovereign" has a particular merit in the ample proportions of its connecting parts.

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SANITARY ENGINEER

PLUMBER AND STEAMFITTER OF CANADA

ESTABLISHED 1907 PUBLISHED TWICE MONTHLY

Vol. XIII. TORONTO, JULY 1, 1919 No. 13

CONTENTS

Don't Wait For Competitive Trade 13-15
Craft Appreciated Prompt Report 15
Boiler Water Treatment 16-18
Some Good News For Our Readers 18
Electrical Business Developing Rapidly 19
Protecting the Home Town Front 20
American Plumbers Co-operating Closely 22
What Others in the Trade Are Doing 23
Editorial Comment 24-25
News From Here and There 26-27
The Question Box 28
Practical Sheet Metal Work 29-30
Heating and Ventilating—Charts 31-32
Ventilating the Modern School 33
Market Conditions and Tendencies 34-36

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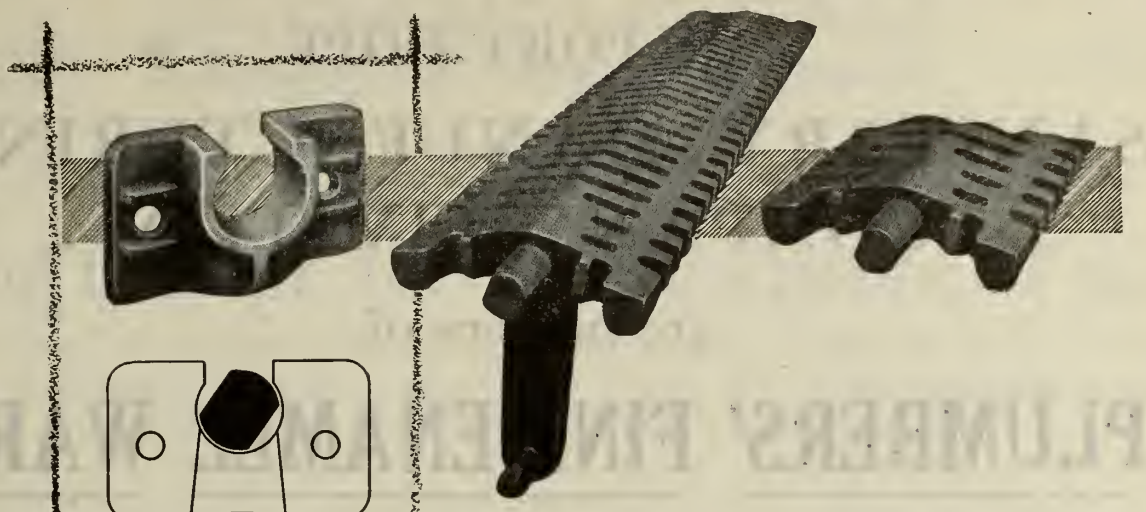


Burnham Boilers

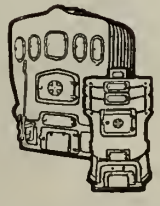
Takes the cuss out of grate cussings

There was a time when we, too, made a profanity-provoking grate; to replace one of the bars of which, it was necessary almost to tear down the boiler

But now all grates can be changed without having to remove a pin or bolt.

Only a hammer is required, and one man can do the work alone.

Every Burnham grate bar is made with two flat and two curved faces to its axle. The flat faces are at an angle from the rocking arm, so that it can't jump out (see cut) of the socket lug, unless purposely tipped to its extreme limit. Then it can be easily lifted out to replace. Or as easily put in.



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PLUMBERS' FINE ENAMEL WARE

The Company's products are sold by every Jobber in Plumbing Supplies from the Atlantic to the Pacific, and their growing popularity is due to the fineness of the fixtures themselves, the ease with which they are installed and the satisfaction they give to particular customers.

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Sanitary Engineer
Plumber and Steamfitter of Canada

Published First and Fifteenth of Month

Vol. XIII. TORONTO, JULY 1, 1919. No. 13

Don't Wait for Competitive Trade

J. E. Yates Co., Brandon, Man., "Goes Out After Business" Before it Gets to Competitive Stage—What Keen Observation Will Do For Sanitary Engineers—Unique Store Display—Selling Electric Lighting Systems

"GO out after the business," is the slogan adopted some years ago and followed successfully by the James E. Yates Co., sanitary engineers, of Brandon, Man.

Mr. Yates does not believe in doing business on even a strictly competitive basis. While competition is looked upon to-day as the acme of business success, Mr. Yates goes it one better by not waiting for prospects to get to the place where competition for their business commences. He has his ear to the ground at all times and has also worked up a local following who note any signs of prospective building or alteration work, and immediately he is tipped off and plans are made to be first on the job when work is ready to be commenced.

Follows Load of Gravel

Mr. Yates illustrates this plan as follows: One day he was returning from an outlying town and noted a load of gravel being hauled along the road a short way ahead. A load of gravel does not convey much to the ordinary individual but Mr. Yates has developed a keen observation, and being of the opinion that the gravel was to be used for building purposes he slowed down his car and followed the wagon. When it turned into a roadway leading to the farmhouse of a man with whom Mr. Yates was acquainted he followed it in, and was surprised to note something which could not be seen from the road; the farmer's house was jacked up and apparently some considerable work was being contemplated.

Aftr parleying with the farmer for some time, and being told that he was not going to further expense to put in any plumbing or heating facilities, Mr. Yates succeeded in formulating such an attractive proposition that before leaving he had secured instructions to instal hot water heating and a soft and hard water system. This was the result of following a load of gravel.

Studies Farm Trade

Another farmer in the vicinity of Brandon had a large barn of valuable

One of the display sections used by James E. Yates Co., Brandon, Man., to bring to the attention of their customers and prospects the various styles of goods which they have to offer. The arrangement is very neat and in its spick-and-span appearance at all times creates a good impression on all who enter the display rooms of this aggressive Western firm. View of another section is shown on the following page of this issue.

This is the first display which greets the visitor to the James E. Yates Co., Brandon, Man., display rooms. It is immediately to the left of the entrance and really serves a double purpose in being an interior display and also a window display. It illustrates a complete three piece bath-room and in addition there is a showing of mirrors, either separate or in the medicine chest, as well as some of the most commonly called for bath-room fittings. To those whose space is limited, there is perhaps a message in this "double exposure."

stock. He had undergone severe financial trials in recent years, and was looking to the sale of the stock on hand to set him up in a few months time. While Mr. Yates knew this farmer could not afford to purchase an electric light plant, he recognized that the farmer was risking his only opportunity of financial rejuvenation by using lanterns for lighting purposes in the barns. Mr. Yates, knowing that this prospect would be good for an extension of credit, outlined the risk the farmer was taking and put forth a proposition which was immediately accepted. An electric lighting system was forthwith installed on this farm and payment was made in due course when the stock was sold.

Gets Tips From Friends

"We have a great many friends who put us in touch with any building activity," says Mr. Yates, "and as soon as work is commenced on an excavation we are immediately made aware of any building which may be contemplated."

The Yates Company has found it good business to watch the society columns of the newspapers for news of marriages, etc. There are many old houses in the vicinity of Brandon which are not equipped with up-to-date facilities, and, when a newly-married couple settles in a house of this kind they immediately become a prospect of the Yates Company for business. Mr. Yates had just secured an order from such a prospect as this to instal a heating and water system at a cost ranging from $800 to $1,000. The newspapers are a valuable source of information regarding the social activities and the building plans of various people both in the city and throughout the surrounding country. Mr. Yates has found it well worth while to watch the papers.

The Yates Company has two men constantly on the road in automobiles, and these men are constantly bringing in business picked up in just such a way as that outlined herewith. Mr. Yates believes in training the observation of his staff as well as his own. These men are on the country roads around Brandon each day and are always on the watch for signs of possible business.

Electric Light Plants

This is an active department of the James Yates Co. business. Mr. Yates finds the new generation of farmers around Brandon are much more disposed towards investing money in modern facilities than were the older generation.

For the purpose of display, a complete system is installed in one of the windows of the Yates store, and a great many electric bulbs are arranged around the window frame. The display illustrates the advantage of the system, the steady and sufficient power which can be supplied, and the elimination of the fire danger where such a plant is substituted for the lantern and lamp.

When asked as to the best way to sell an electric light system Mr. Yates replied that once a system is installed on a farm it acts as the best advertisement of the advantages to be gained. Farmers from the surrounding district will gather to see how the system works, and then when they are free to discuss the matter without being urged on by a salesman they come quicker to a realization of the distinct value of such a plant.

A great many farm homes and buildings are wiped out by fire, and a good sized conflagration may reduce a farmer to low financial standing. A large number of such fires are caused by lanterns and lamps. It is apparent that the elimination of the fire danger is one of the biggest points of value in such a plant.

Unique Display Features

It is not only in the outdoor department of the Yates business that this company excels in unique features, for the arrangement and display of the various lines in the store shows that much forethought and consideration have been given to the matter.

There are six sections for the display of the various lines individually, on a floor which is raised a few inches from the aisle down the middle of the store. Partitions about four feet in height have been erected around the sections, and the whole interior of the store is finished in white enamel, kept absolutely clean. The result of this arrangement is that wall fixtures may be shown to better advantage as each is backed against a portion of the partition or wall, and the division into sections gives better facilities for display.

The Reason For The Raised Floor

Mr. Yates points with pride to the ef-

fective way in which the various sinks, pumps, closets, etc., are displayed in their individual sections. There is an interesting feature to note in connection with the raised floor. The floor of the display sections was raised a few inches above the main aisle for the purpose of keeping unlikely prospects from marring the splendor of the various articles on display. There is a peculiar psychology in human beings which will not urge them to undue exertion unless the interest warrants such. Mr. Yates was quick to observe this tendency in his visitors, and hence the raising of the display floor. After watching the effect for some time Mr. Yates has confirmed his opinion on the subject, namely that those who are really interested and are good prospects will step up the few inches to examine the articles closely, and those who are not really interested and are "just looking" will look from the aisle as they will unconsciously feel that the raised portion of the floor is not to be walked on. In this way no offense is shown and the job of keeping the various articles resplendent in their polished brilliancy is rendered less difficult.

The display shown in the J. E. Yates Company store is truly an example of what sanitary engineers can achieve in the way of display, and the idea that this class of trade has not much to gain from attractive store displays is one which is fast going into the discard. Mr. Yates has found this out, and close attention to the appearance of his store is paying him back in dollars and cents.

TO SAVE ELECTRIC BULBS

Experiments in which the Government is taking part are now in progress at Madison, Wisconsin, to try and eliminate the enormous loss due to the breakage of electric light bulbs in shipping. At the present time no less than 150,000,000 bulbs are being produced each year. These figures indicated what an item it is to the big manufacturers if they can save breakage in their wholesale shipments, and this explains why at the forest products laboratory, in Madison, the manufacturers have thought little of smashing $4,000 worth of bulbs in an intensive study of the problem of how not to have bulbs break in shipment.

Three of the nation's biggest producers have sent experts to Madison to conduct a series of tests with a new style of packing. If the new material saves enough bulbs from breakage, an entire change in the manner of making shipments may be adopted. The experiments have so far proved nothing, but the engineers in charge who are working at the Government plant, on experiments of their own, are confident that the annual breakage will be materially reduced.

If one-tenth of 1 per cent. of the nation's shipments are now broken in shipment and this breakage, by a different packing, can be cut in half, the companies will save a total of some 75,000 lamps a year.

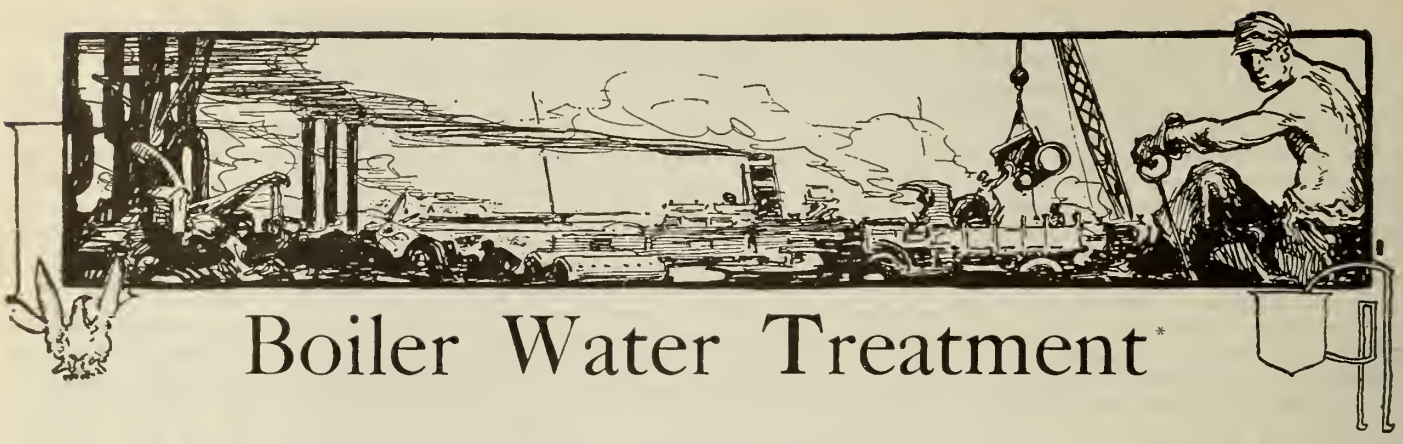
SHOULD KEEP BOOKS

The importance of doing business in a proper way was emphasized by the investigators at the school probe now going on in Toronto. After referring to the hopeless task of getting at accurate details by questioning, Mr. Shirley Davidson said in part: "There can be no more sinister reference against the honesty of a trustee than that he keeps no books. Even the criminal code provides that if the court finds that a suspect has kept no books he may be sent to jail. That just illustrates the idea of the law as to keeping books. A man should keep books if he wishes to keep honest." In commenting further on the case he stated that no books had been kept for twenty-seven years and that this was no oversight, but deliberate defiance, despite a report made by Judge Winchester some time ago.

CRAFT APPRECIATED PROMPT REPORT

From all parts of the Dominion congratulations have come to SANITARY ENGINEER for the very complete and detailed report which appeared in the issue of June 15 of the Twenty-third Annual Convention of the Canadian Society of Domestic Sanitary and Heating Engineers at Montreal.

SANITARY ENGINEER was the first publication of any kind to carry this report in full. Realizing just how important to the men in the trade it was to present in detail the discussions on the various topics, SANITARY ENGINEER was represented at every session. As was expected, a great many matters of real interest to the trade from one end of the Dominion to the other were taken up. The views of men who are leaders in their profession are always not only of interest, but of value to others. Many hundreds of plumbers, scattered all over Canada from coast to coast, who were unable to attend the big meeting at Montreal and take part in discussions of national importance, were enabled through the detailed reports in SANITARY ENGINEER to follow what occurred almost as closely as though they had been there. Service of this kind means a lot of work and no small expense in getting a lengthy report of this kind to a large number of readers quickly. SANITARY ENGINEER succeeded in doing this and the letters of appreciation that have been received and the messages of congratulation that have come in are their own reward and recognition of the service this publication aims to give its readers.



Boiler Water Treatment*

A source of unnecessary waste of fuel originates in the use in boilers of so-called "hard" water. This leads to the deposition upon the boiler metal of insulating material contained in the water which retards the flow of heat from the furnace to the water to such an extent that the amount of heat escaping through the stack is materially increased.

How a notable reduction in factory heat losses may be effected through the substitution of "softened" for "hard" boiler water is clearly shown in this bulletin.

This is one of a series of Engineering Bulletins issued by the United States Fuel Administration in collaboration with Bureau of Mines, Department of the Interior, under their slogan of Maximum Production, Minimum Waste. It is the intention of SANITARY ENGINEER *to reprint, through their courtesy, additional bulletins as available. There is much of interest to the owner of an industrial plant or those engaged therein in this article. The next bulletin which will be dealt with is, "Saving Coal in Steam Power Plants," which will appear in the next issue.* —EDITOR'S NOTE.

IF you cover a steam pipe with asbestos, magnesia, or other heat-insulating material, you keep the heat in the steam; if you line or coat a boiler tube with scale or other heat-insulating material, you keep the heat out of the boiler water, and send it to the stack. By lagging your pipes you save fuel easily. By lining your tubes with scale you waste it continuously and needlessly.

The Nature and Origin of Scale Formers in Boiler Water

All natural waters contain more or less of this heat-insulating material, partly as suspended matter (such as clay, fine sand, insoluble forms of iron, aluminum, etc.), partly as dissolved matter, such as compounds of calcium, sodium, potassium, and other minerals salts.

Much of the suspended matter, as well as most of the dissolved matter, may form scale, but the suspended matter may generally be removed by filtration, which will be discussed later.

Dissolved Matter Which Forms Scale

Of the material commonly in solution in boiler waters, the bicarbonates and sulphates of calcium and magnesium are the most important scale formers. Natural waters containing in solution bicarbonate of calcium or magnesium, or both, exhibit what is called "temporary" or "carbonate" hardness; those containing dissolved calcium or magnesium sulphate, or both, possess "permanent" or "sulphate" hardness. In the case of the sulphate scale the temperature required to separate it is too high to make its removal by heating alone a practical means of treatment. In the case of water exhibiting carbonate or temporary hardness great improvement in its properties may be effected by the use of open heaters of the exhaust steam type. As a rule sulphate scale is denser in structure with a higher heat-insulating value than carbonate scale, but the conditions of formation affect this considerably. Where a porous structure permits water to penetrate the scale its heat-insulating effect is greatly reduced.

The Effect of Scale

In many respects the effect of an increasing deposit of scale on the passage of heat through the walls of a boiler tube is very similar to the effect on the passage of water through a tube of continually decreasing bore. In the case of the water tube, the only way to get a uniform volume of water through it in a given time, in spite of its diminishing bore, is continually to increase the pressure in water; so in the case of boiler a tube covered with a dense scale the only way to maintain a constant flow of heat from the furnace to the boiler water is to increase the "heat pressure," so to speak; that is, to burn more fuel.

Heat loss.—The most important effect of scale is due to the fact that in certain forms it is a wonderful heat insulator. Its chemical composition seems to have little to do with its heat-insulating power, the big question being the density or mechanical structure of the scale. A series of experiments by Prof. Schmidt, of the University of Illinois, gave the following results, showing decrease in heat-transfer efficiency of tubes coated with scale of different thickness and composition:—

Character of scale.	Thickness Inch	Composition.	Loss of efficiency
Hard	1/50	Mostly carbonate	9
Soft	1/32	" "	7
Hard	1/32	" "	8
Soft	1/25	" "	8
Hard	1/25	Mostly sulphate	9
Hard	1/20	" "	11
Soft	1/16	" "	10
Soft	1/16	Mostly carbonate	11
Soft	1/16	" "	12
Hard	1/16	" "	12
Soft	1/11	" "	15
Hard	1/9	Mostly sulphate	16

This expressed in dollars and cents means that with a deposit of 1-9 inch of scale, 16 cents of every dollar paid for coal is lost.

The data just given must not be regarded, however, as indicating that the decrease in the heat-carrying capacity of scale covered tubes can always be calculated with the accuracy that these figures would indicate. The important facts are, though, that the loss is easily prevented and that the advantages of soft water abundantly justify all expenditure necessary to secure it.

Just what the loss is in any particular case could best

*For a very elaborate discussion of this subject see Bulletin No. 1752, University of Texas, by W. T. Read and E. P. Shoch. The table showing the calculated reduction of heat-transfer efficiency was taken from this source, and the discussion of the zeolite process is based on data furnished by that bulletin.

be determined by comparing the fuel consumption with clean and then with scale-covered tubes, other operating conditions being kept uniform.

Means of Removing "Scale Formers" From Water

The methods employed in softening water may be divided into two main classes, (a) those in which the scale-forming property is removed before the water enters the boiler, (b) those in which the softening is effected within the boiler itself by means of so-called "boiler compounds."

As to which one of the two classes of methods should be employed in any particular case would depend on the size of the plant, and on the character of the water to be softened. In the case of waters of abnormal composition, it would frequently be impossible to produce a satisfactory water by either method and a new water supply would be necessary.

It can not be too strongly emphasized that this question of water treatment is one in which the employment of competent chemical and engineering knowledge is both absolutely necessary and highly profitable, and it would be far wiser to omit all forms of water treatment (involving the use of chemicals) rather than to undertake such without knowing accurately the composition of the water and of the material used to soften it. It is most important to remember that the quality of the water, even when secured from the same source, varies widely from time to time. These variations are not only seasonal and monthly, but daily and even hourly. A condition of excessive concentration of the water after a protracted drought may be changed within an hour to a correspondingly excessive dilution by a summer storm. The result would be to decrease enormously the percentage of dissolved matter and to increase, probably to a much greater degree, the amount of suspended matter.

As a consequence, a prescribed treatment of the water based on its analysis at any particular time might not lead to satisfactory results if applied at some other period.

As an instance of the serious danger of an unintelligent "dosing" of boiler waters may be cited the results of a long series of investigations which have, apparently, shown that carbonate of soda in solution produces brittleness in boiler steel. Carbonate of soda (soda ash) is used in most water-treating processes and its unintelligent use may readily lead to a very dangerous condition in a boiler.

When Boiler Compounds May Be Used

Boiler compounds afford a very useful means of boiler-water treatment in plants whose size or value of output would not justify the use of a more expensive method. This would be true of a large percentage of the plants of the country.

In spite of a great variety of trade names a very large percentage of all boiler compounds consist most largely of carbonate of soda, to which caustic soda is sometimes added, and occasionally phosphate of soda. Starchy materials, and those containing tannin, are frequent ingredients. The supposed effect of these last two materials is to coat the particles of precipitated incrusting material and prevent its cohesion into compact scale.

Objections to the Use of Boiler Compounds

The chief disadvantage (assuming that they are used intelligently) is the necessity of frequently blowing down the boiler to prevent the accumulation of "sludge" and of alkaline (sodium) salts in the water, both of which cause foaming. Furthermore, this blowing down must be supplemented by washing out, and occasionally closing down the boiler to complete the removal of the sludge and of the boiler compound itself.

Whenever competent supervision of boiler-water treatment is available within the plant organization, it is preferable to soften the water before it enters the boiler, and this must be done when the percentage of scale-forming ingredients is high.

Water Softening by Other Chemical Means

By treating the water before it enters the boiler.—The removal of scale-forming components from water by chemical means, whether before or after entering the boiler, is accomplished by converting the calcium and magnesium compounds into practically insoluble forms, causing them to separate from the water and allowing the material to be removed by blowing down, filtering, or sometimes by settling. Lime and soda ash are generally used for this purpose when the softening occurs before the water enters the boiler. The lime combines with the carbon dioxide, which held the calcium and magnesium carbonates in solution; these are no longer soluble in the water after removing the carbon dioxide, and therefore separate from it. In a similar way the sulphate scale is removed by its conversion to insoluble carbonate by the soda ash.

The lime-soda process.—There are in current use in power plants practically only one lime-soda process, of which there are two varieties differing chiefly in the temperature of the water when treated. In all essential respects the two varieties are similar. The treatment consists of adding to the "raw" water softening agents in carefully controlled amount (which must agree with the composition of the water), mixing these thoroughly within the water, and permitting sufficient time to elapse for the separation of the "sludge" before the water is fed to the boiler.

In the case of the "hot-continuous" process this separation is effected more rapidly, which permits of less storage capacity than in the case of in the cold-continuous. In all cases, though, it is of the utmost importance to provide sufficient storage space to allow the sludge to be completely deposited before the water is fed to the boiler; otherwise the partially completed softening process will be completed within the heater, and the purpose of the treatment will be largely defeated. Another advantage of the hot process is that it expels the air from the water and so reduces the corrosion.

The zeolite process.—This is entirely unlike the processes described above and (unlike them) gives a water of zero hardness. The softening agent is an artifical material composed largely of sodium compounds, which are exchanged for the incrusting (scale forming) material of the water; that is, the water dissolves sodium compounds from the softener and replaces it by the calcium and magnesium which had caused the hardness of the water. The hard water simply flows over the permutit packed in a cylinder, or is forced up through it and flows from it with all scale-forming material removed. After a time the softener must be regenerated by allowing a solution of salt to flow over it, restoring its original composition and activity. The "permutit" process is a well-known efficient variety of the zeolite treatment.

Advantages and Disadvantages of Zeolite Process

The construction and operation of this softening equipment is extremely simple, and, as already stated, water of zero hardness is furnished. On the other hand, in the case of water of a high degree of temporary or carbonate hardness there is a correspondingly large amount of sodium salts introduced into the water so that foaming is liable to occur (as is liable to occur when softening water of a similar composition by means of boiler compounds). In such cases the following modified form of the zeolite process is used.

The Lime Zeolite Process

In this an intermittent or continuous tank equipment, as described already under the lime-soda process, is connected through a filter to a zeolite softener. Only lime is used in the tank, the soda compound being secured from the zeolite. The filter is placed between the tank and the zeolite softener to avoid any sludge coating the permutit particles and so impairing its efficiency.

Filters.—No process of water softening is satisfactory unless the amount of suspended matter is reduced to a

minimum. In the case of very finely divided matter this may be done by adding so called coagulants—alum, for example—but these should be used with extreme caution and always under expert direction. Ordinarily, though, such suspended matter is removed by filters, of which the sand filter with a down flow of the water is the most satisfactory type. They are not expensive either in original or maintenance costs.

Removing Scale Already Formed

The purpose of the methods described above is to prevent the formation of scale. There is another class of water-treating material used largely to remove scale already formed and to some extent prevent the formation of new scale. Graphite and kerosene are most often used for these purposes. Their action seems entirely mechanical.

Opinions as to the desirability of their use vary from enthusiastic commendation to absolute condemnation, though their use seems generally approved by practical men. Neither should be used, however, in boilers in which there is already a heavy deposit of scale, as the loosening of this and its accumulation in the bottom of the boiler is apt to lead to blistered and bagged boiler metal. Both graphite and kerosene should be used very cautiously. Kerosene, if used in excessive quantity, is apt to distil over and attack gaskets.

Some Examples of Economies Effected by Softening Water

There is a very direct relation between softening water and saving fuel; the following are a few cases reported of such economies:

1. A marble company reports a saving of 21 per cent. of fuel by softening its boiler water.

2. A crucible steel company, by substituting soft for hard water, effected a saving of 3,600 tons of coal per annum, which based on current prices would be valued at about $22,000.

3. The Chicago & Northwestern Railroad Co., comparing its operating expenses in 1902-3 before and after softening its water supply, reported a saving of $75,000 per annum. This saving was effected at a period when coal cost probably less than one-half the prices charged to-day (1918).

4. In addition to these, other cases have been reported in which the profits resulting directly from the substitution of soft for hard water have been reported as varying from 32 per cent. on an investment of $7,200 to 71 per cent. on an investment of $7,000. These profits resulted largely from the elimination or reduction of operating costs, such as cleaning heaters, piping and economizers, cost of cleaning instruments, interests, and depreciation on spare or idle boiler, etc.

5. Furthermore, it has been estimated that the use of hard water in a great number of the locomotive boilers of the country involves the consumption of 15,000,000 tons of coal more than would be needed were soft water only used.

6. A steel company, whose annual output is 50,000 tons reports a saving of 200 pounds of coal per ton of steel resulting from the softening of its boiler water.

The above are convincing evidences of the opportunity presented to power-plant operators for saving, by means of water softening, a very considerable proportion of the coal which will be mined during the current year.

The United States Fuel Administration feels that it can count very confidently on the adoption by all power-plant operators of this simple and effective means of fuel economy, which is of such especially vital concern at present

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IT COSTS more now to get your picture painted than formerly. Still that is one form of dissipation that we can side-step and still have a fairly good time.

* * *

OCCASIONALLY one sees a stork in the Zoo, but there must be a stack of these things some place in the woods, for there were 1,352,792 births in United States last year.

* * *

A CALIFORNIA man left $19,000 to his son. The only string is that the son has to earn $30,000 clear before he can get the $19,000. Chances are that by the time he piles up that sum he'll have cut enough wisdom teeth to know how to handle the smaller amount. It looks as though that fond parent knew a thing or two that the average chap never thinks about.

* * *

TORONTO has had a street car strike for over a week. Of course, there have been some cases of inconvenience. The remarkable thing is how well people have got along without the cars. The automobile age has provided a tremendous amount of transportation. Each year now will make it increasingly hard for a street car strike in any large city to inflict the inconvenience of ten years ago on the general public.

Some Good News for Our Readers

OPINIONS vary as to the value of the window or interior display from the sanitary and heating engineer's point of view. However, there is no getting away from the fact that the story we have secured from a Brantford, Ont., firm, which will illustrate the many displays this firm uses, is a dandy and even the skeptics cannot help but be impressed by the showing this firm makes. This will be a feature story for the July 15 issue of SANITARY ENGINEER.

There will be another lecture by the noted merchandising expert, Frank Stockdale, on the subjects "Salespeople of To-day and To-morrow." Mr. Stockdale, in this lecture, makes an interesting distinction between "pulling" and merely "waiting on" a customer. This is a decidedly live topic to the sanitary and heating trades to-day and much interest will be found in its careful reading. The questions of service, of viewing the sale from the other side of the counter, handling the difficult customers, are among the interesting questions that are dealt with in this lecture.

The next issue will also contain the second in the series on fuel conservation issued by the United States Fuel Administration in collaboration with Bureau of Mines, Department of the Interior, on "Saving Coal in Steam Power Plants." This will be of decided interest to many readers and will be well illustrated.

Electrical Business Developing Fast

Insistent Demand From All Over the Country for Electrical Labor-Saving Devices in the Home—Revival of Building Offers Splendid Opportunity for Sale of Electrical Fixtures

THAT there is big business ahead in electrical utilities and electrical fixtures is the opinion of those in close touch with the electrical development that is going on all over Canada. An absolutely legitimate field, in which many sanitary engineers are already making good profits, is wide open to the trade, with a volume of business which is bound to increase every year. There is not only a lot of good business to be had now, but with the steady extension of electric lines into the rural districts, the purchase by farmers in outlying sections of their own power plants, and the general and insistent call for more and more labor saving appliances in the homes, the business has a future that is rosy indeed. Many American firms are predicting that the business in appliances and fixtures is going to rival that in motors and supplies, which runs into many millions annually. If this is true in the States it will be equally true in Canada, and is already apparent in the demands that are being made upon the electric power companies for more and still more power to take care of the increasing loads.

Demand for Fixtures

For the past four years, owing to conditions and restrictions, electrical development has been held back. It is still held back, but not because of restrictions. hTe situation at present revolves around the inability to get sufficient supplies of materials with which to fill orders for equipment. In Ontario there are a number of requests in for new power lines and extensions to power lines. Some of these will not be proceeded with for two reasons. One is the difficulty of obtaining equipment required to construct the lines. Some of the lines will go ahead this year. Others will be held back pending lower costs. But they will be built sooner or later and in the meantime new projects are constantly being developed. Those who are in touch with the situation in those districts where it will be impracticable to build power lines declare that there is a noticeable increase in the sales of home power plants. People want electricity and they are going to have it, even if they have to put in their own plant. Every plant of this kind that is put in, and there are many of them being sold all the time, means just that many more prospects for the sanitary engineer to increase his business.

The farmers, all over the Dominion, are getting to be big buyers of electrical devices. Many of them now light

Continued on page 27

An electrical display such as is shown above contains any number of suggestions that are of real interest and value to buyers. Every article makes an attractive showing and collectively they make a feature that would enhance any store and create in those coming in the desire to buy. At night when the lights are all turned on the general effect is even more attractive. Many plumbers are finding that electrical goods are splendid sellers and a big help in bringing additional business to their shops.

Protecting the Home Town Front

The Part That "Mud" Plays in the Success of a Town—The Four Important Factors in a Town's Growth—Measuring Miles by Minutes—Getting the Right Sort of People to the Town—The 100 Per Cent. Citizen

THERE is a message here for every sanitary and heating engineer who derives a living in the smaller towns and it is to give the ideas of one of the most noted Merchandising experts in America that this talk is reproduced. Frank Stockdale is becoming better known in Canada every year. He has delivered lectures in a vast number of communities in Canada during the past year, and a multitude of merchants are looking to him to throw some light on many vexed problems of merchandising. Among the places he lectured at recently was Regina, where he delivered a course of lectures in connection with the convention of the Retail Merchants' Association, Saskatchewan branch. A special representative of SANITARY ENGINEER attended the convention to take a report of these addresses and this one containing a distinct message for the sanitary engineer in his relation to his community is the first to be reproduced.

The next lecture deals with the subject, "Salespeople of To-day and To-morrow." Mr. Stockdale in this lecture makes an interesting distinction between "selling" and merely "waiting on" a customer. The question of service, of viewing the sale from the other side of the counter, handling the difficult customer, are among the interesting questions that are dealt with in this lecture.

"IN my opinion the day has arrived in most places, and will arrive in all places, when the competition to which you must give your attention as a part of your business will take you outside of your own stores and hook you up in the ranks of the protectors of the home town front. Competition is no longer between individuals exclusively. in many places the main competition is not between individuals but between towns. The town problem is one you will be interested in when you know what it means.

"In the State of North Dakota is being carried on a campaign, and the object of that campaign is to promote the interests and the welfare of the communities of that state as a whole. In the United States there are at least 10,000 declining towns. In Illinois between 1900 and 1910 there were 357 incorporated cities and towns that actually went backward in that period. These centres had fewer people in 1910 than in 1900. That is an indication of an almost universal condition.

"The whole of Canada is going forward in population, but we have this problem on our hands. I like to compare the community of to-day with the family of yesterday. The family of yesterday had the spinning wheel in the home. Now we have in the community a man responsible for bringing clothing to the homes. Yesterday people raised and ground their own cereals, whereas to-day the retail grocer is responsible for supplying foodstuffs. Yesterday the man cut his wood or dug the mine, whereas to-day the coal man provides these fuels. Things that used to be done in the home are being done in the community by other people. The communities are the big families to which we belong, and the trouble is we do not recognize our relationship to that family. We look upon ourselves as individuals, but we have an inter-dependence with provincial and national life. A house divided against itself cannot stand. That is historical. A community divided against itself cannot prosper.

Fewer and Bigger Towns

"There are tendencies going on towards the centralization of population. In my opinion we are going to have fewer towns and bigger towns. Community building is a real problem.

"The greatest ally of the mail order house is spelled with three letters, 'MUD.' In your town two things are necessary to make good towns. Good roads and good stores. Good roads make a poor town, unless it has good stores in it. Good stores don't make a good town, unless there are good roads in an agricultural community. The town with the best roads and stores will be the best town.

Things That Make a Good Town Internally

"A town must be a good place to live in and a good place to make a living in. One of the problems of the Canadian Northwest is to make your towns a good place in which to live. The natural advantages of that country are unsurpassed."

The following four points were emphasized by Mr. Stockdale as being the essentials of a good town:

Production or manufacture.
Transportation.
Trade.
Civic Welfare.

"People are congregated in a town for trade," continued Mr. Stockdale. "If the prosperity growing out of that trade is not directed along the lines of civic welfare, the town is not much good. Water supply, sanitation, streets, sidewalks, schools, entertainment features are the essentials of civic welfare. In all new countries the problem is to make them good places to live in. People make values and the country wants people.

Town as Big as the Territory Served

"The single taxers say 60% of our values are social values or community values brought about by the coming together of people. There is a lot of truth in this. The average man does not realize what it means to bring people to his town, or what it means for people to go out of his town. The farmer opposes the interests of the farm, because of the imaginary Chinese wall built around the town. How big is your town? You will say 200, 300, or 1,000. Your town is as big as the trade territory that you supply. If you reach out fifty miles, that is the size of your town. You want to protect that town front. The fronts will overlap a great deal.

"One farmer thinks the town people are a nuisance and sends away for everything he wants. This farmer's land is worth $100 an acre, compared with $20 for better land in another section not so close to town facilities. He gave for his reason for not moving to the better and cheaper land the fact that he had had enough pioneering. This farmer's land was worth five times the price of better land, because it was near a town.

"You cannot pioneer in a crowd. The farmer's wife has social connections in town, the children attend the town schools, the son works in a store in town. These things enhance the value of the land located near the town, and the farmer owes the town something for increasing the value of his property.

"The bigger the town is, the farther

the influence on farm property extends. Some people vote down school improvements, but this is a serious matter. The town with good schools and churches draws people. This is the basis of community development.

Attracting the Right People

"How can you induce the greatest number of people to live in your community? There are two kinds of people that are attracted to communities; one is the old man who has made his money. The other is the young man who wants to make his money. One has fortune and the other has energy. These are the shifters. Communities of the East are losing to the communities of the West the men of this class. Old men go to California, because it is a better place to live in. The man who makes money in this country gets out of this country unless he gets good roads. There are 75,000 people from the State of Iowa in the Iowa Society of California. There are 125,000 Iowans in California. They are not there for the climate, as most people think. California has had its climate for a long time, but it is only recently that the people have got the habit of going out there in such numbers. One official of the railways, who investigated the matter, said people were going to California for good roads. One farmer in California stated that he spent most of his time motoring while in California, and that he spent $6,200 in five years on car expenses.

"The climate makers of California are the drawing card. The spirit of the people of California makes it what it is. They are real boosters in Los Angeles —the city advertising built. They back their boosting with their money too. The booster who does not back it with his money is a four-flusher.

"Good roads are needed to hold the people, and good roads are a factor that is developing and causing this evolution in our communities.

Measuring Miles by Minutes

"The way to measure distance is not by miles, but by minutes, between towns. Thirty-five miles may be forty-five minutes, or four hours. Good roads will develop the community, and these good roads are going to eliminate a lot of the small towns. There are just two things a small town can do—either grow into a big town, or get off the map. Small-town people get busy.

"If a town has good transportation it is a good retail town. The support of the town comes from the dollars that go over the retail counter. Thirty cents of every dollar goes to pay telephone, out of every dollar and goes into circulation.

"Retailers are the backbone of the community from an economic standpoint. It is not what a man earns—that is an individual asset, but what he spends—that is a community asset."

A 100 Per Cent. Citizen

At this point Mr. Stockdale outlined the following as a 100 per cent. citizen:

Man who works in community, 10 per cent.

Man who lives in community, 40 per cent.

Man who spends for all he needs in community, 50 per cent.

"Money must go over the retail counter before you can have civic welfare," said Mr. Stockdale, continuing. "The trouble with the average community is 'smugosity' (a word coined by Mr. Stockdale to express the self-centred composure of some communities). Smug meaning self-satisfied,and ossified meaning bone.

"Ignorance is shown in modern community building. We adhere too much to individuals. The price of co-operation is sacrifice. You have to sacrifice some of the things you would have as an individual to have the things you would have by co-operation.

"What is the great improvement in city government, which we have had in the last few years? The commission form of government. You cannot wipe out a town instantaneously, but it is the slow fire of competition which does the damage. The war shows the value of unity of command, purpose and action. That is the secret of community building.

"Some towns furnish everything to make a real organization, but nobody is willing to furnish the time and energy. We have to get all the interests of the community together. If you are going to have a good community you must get individual responsibility. This co-operative work is a part of your business, not as a community duty. You help to gain by helping the other fellow to gain.

"If you want to live in the kind of a town
Like the kind of a town you like,
You needn't slip your clothes in a grip
And start on a long, long hike.
You'll only find what you left behind,
For there's nothing that's really new.
It's a knock at yourself when you knock your town.
It isn't your town—it's you.

"Real towns are not made by men afraid
Lest somebody else gets ahead.
When everybody works and nobody shirks,
You can raise a town from the dead.
And if, when you make your personal stake
Your neighbor can make one, too,
Your town will be what you want to see,
It isn't your town—it's YOU."

REQUIRE LICENSES

The Safety and Health Committee of the council at Edmonton, Alta., has recommended the passing of a by-law compelling all persons who do electric work to take out a license. The matter was taken up with the committee by a delegation of electrical contractors. Some objection is being taken to the by-law on the ground that it is too arbitrary.

QUESTIONS AND ANSWERS

Continued from page 28

CAN'T RAISE STEAM PRESSURE

Question:—Last fall we installed a ——boiler in a store at ——. We have never been able to raise one pound of steam on it. We had never put that type of boiler in any of our buildings before, but we know that other people have been able to raise steam on the same size of boiler carrying a larger load of radiation. The people that sold it to us have promised to send a man down to see what is the matter, but we have not seen him yet, and while waiting for him we thought we would write to you and see if you could suggest what might be the trouble. We have washed the boiler out several times with soda, so the water should be clean. Another thing, there seems to be a rumbling in the boiler whenever we have a good fire burning.

Answer: — The noise in the boiler would lead us to believe that there was still some oil in the boiler in spite of the frequent washings that it has received. We would suggest that you turn off all the radiators and run the water off the boiler through the safety valve opening, while maintaining a hot fire on the grates. The flushing out of the boiler should be maintained steadily for three hours at least with steam pressure indicating on the gauge up to 10 lbs. See that the boiler is setting level on the floor. See that there are no air leaks into the boiler caused either by missing cleanout stoppers or otherwise; that the check draft is not open; that draft chains are properly adjusted; that weights on automatic damper levers are in their proper positions; that the damper is set the right way; that the heating surfaces are clean and that there is no core sand in the grate teeth. Examine the flue and see that there are none of the following conditions: Cleanout door allowing air to leak into the flue. Flues cross connecting. Air leaks of any kind in flue, including pipe of any other appliances. Smoke pipe reduced. Smoke pipe in flue too far in. Reduced size of flue. Flue not high enough. Boiler too far from flue. Obstruction in flue. No air entering boiler room. Other buildings or trees affecting draft.

BALDWINS, LTD., TO HAVE TIN PLATE MILL AT TORONTO

Baldwins, Ltd., of Swansea, Wales, is negotiating with the Imperial Munitions Board and the Harbor Commissioners of Toronto to purchase the plant of the British Forgings Co., at Toronto, Baldwins, Ltd., plans to establish a large tin plate mill and would use the electric furnace of the forgings plant in making steel ingots. The plant has a capacity of about 450 tons of steel per day. It would be adaptable to the manufacture of tin plate with few changes so far as the electric plant is concerned, but considerable additions would be required for the rolling and dipping of the plate.

American Plumbers Co-operating

Secretary Frankland Tells of Good Results Reported by Delegates to the Big Convention at Atlantic City—Trade Extension Idea Is to Make Every Plumber a Business Man and a Salesman

"THE members of the craft in the United States have realized the value of co-operation and they are working together splendidly and getting real results," said Garrett F. Frankland, of Toronto, secretary of the Canadian Society of Domestic, Sanitary and Heating Engineers to SANITARY ENGINEER on his return from Atlantic City, where, as official delegate from the Canadian organization, he attended the thirty-seventh annual meeting of the National Association of Master Plumbers of the United States. There was a large attendance from all parts of the country at the gathering, which was held on June 17th, 18th, 19th, and Mr. Frankland states that a great deal of time was spent in the discussion of what has been done through co-operaone can see is the trade extension plan This work is carried on by the Trade Extension Bureau. One of the ideas of the Bureau is to impress upon every plumber the vital importance of his being a businessman and a salesman. A paragraph issued to the trade in a recent bulletin of the Extension Bureau sums up the whole idea as follows: "When every contracting plumber and fitter has become a businessman and a salesman and when every old building has been renovated of its antiquated plumbing and heating, then our work will be done."

Adopting the Plan

"The plumbers on the other side of the line have realized that if they were to get anywhere they had to learn the business side of their trade. No matter how good a workman a man was if he did not know how to figure correctly, and that means taking account of overhead and everything else, he was going to come out short. This situation was just as bad in the United States as it is in Canada and for exactly the same reasons, the plumber was a plumber and knew nothing about business. Through the work of the various associations and of the Trade Extension Bureau, though, the number of plumbers who are becoming real businessmen and real salesmen has been tremendously increased. The movement is gaining ground all the time, because the plumbers who are still working along the old lines are finding out that they are not able to remain in the race with men who are doing business in the right way. They are falling in line, not by ones or twos, but in scores.

Lesson for Canadians

"There is a big lesson for the plumbers of Canada in what their comrades across the line are doing. They can see the results of working along the right lines, eliminating price cutting, charging fair prices that allow of fair profits, and of going after business in an aggressive manner. Every man in the trade should be a businessman, and everyone should also be a salesman. We are working through our associations along these lines in Canada, and every plumber in the country should give the work his most hearty support."

Mr. Frankland states that at the convention there was a good deal of discussion regarding reconstruction problems, especially in connection with the building trades. The opinion was general that a great deal of work will be carried on and the trade appeared most optimistic regarding the outlook.

Co-operation Counts

The Trade Extension Bureau will do its share in helping the plumbers to go after new business, especially in developing small business. A campaign is planned in which the manufacturers will take a very active part and in which advertising will be a feature. The master plumbers are also co-operating actively in all that is being done. Mr. Frankland states that the Trade Extension Bureau is an exceptionally strong organization, which includes the National Association of Master Plumbers, National Association of Heating and Piping Contractors, the Range Boiler Manufacturers, Sanitary Potters' Association, Soil Pipe Manufacturers' Association, National Association of Brass Manufacturers, Enamelled Sanitary Ware Manufacturers', Association, the National Boiler and Radiator Manufacturers' Association, the Trade Press and other bodies. It is aimed to deal with all trade problems in a practical way and in the manner best suited to work out in the best interests of all. It has been working for nearly two years and has made great progress, and this is being fully maintained.

Had a Booth

In order to extend its work among those who attended the big convention in Atlantic City the Bureau had a special booth, where all the visitors were welcomed and the objects of the work explained. Mr. Frankland states that many of the manufacturers and jobbers also had exhibits in which the delegates were keenly interested.

In connection with the work of the Ontario Association, of which he is also secretary, Mr. Frankland is planning shortly to visit the Niagara Falls district and discuss trade matters, especially organization work, with the members of the craft. Other work of a similar nature will be undertaken in various parts of the province, and the members of the Executive plan to hold monthly meetings at points from which they receive requests for help in connection with the work. In the evenings, after the regular executive meetings, they plan to visit the local associations and discuss with them matters of importance to the trade.

A RISKY OCCUPATION

The Toronto "Globe" man has been figuring out the capacity of electric furnaces. Simple thing, too—just as simple as measuring snow with a stic' or stepping off a frontage with your feet.

The "Globe" goes on to say that Toronto has "the largest single electric steel plant in the world as far as known." So far so good. Then the "Globe" goes on to tell its readers just how great this great furnace is:—

"The ten six-ton Heroult furnaces at the British Forgings plant are capable of turning out sixty tons of high-grade steel per day."

Quite so, but why stop at sixty? The "Globe's" man has proceeded on the good old plan that two and two make four. Therefore, ten six-ton furnaces equal ten times six, which makes sixty! Splendid!

But the "Globe" might be surprised to know that this plant has turned out as high as 350 tons per 24 hours, even with its "sixty tons per day" capacity. As a matter of fact, these furnaces can take a heat every five hours, and if worked at anything near real capacity, can make five heats per day. Taking only sixty tons per day from such an outfit as the British Forgings have would be about the same as having a plant and staff equal to that of the "Globe" for the production of a weekly paper.

The "Globe" is quite right in stating that ten times six makes sixty, but it should also recognize that computing the capacity of electric furnaces is slightly different from painting the political situation at Ottawa.

CAUSED BY LIGHTNING

Lightning started a fire which caused a loss of $1,800 at the Anthes Foundry in Toronto. John Bibby, the manager, had his arms somewhat severely burned while trying to rescue his auto.

What Others in the Trade Are Doing

How Plumbers All Over the Dominion Are Keeping Their Names Before the Public —There May be Many Hints in Some of These Advertisements Which You Can Use With Good Results When You Are Arranging Your Own Copy

Andrew Sheret, Victoria, B.C., devotes one-half of his double column advertisement, two and a half inches deep, to an illustration of a handsomely tiled bathroom in which HEALTH, represented by a woman, is a central figure. The rest of the ad. is occupied by the following announcement: "Plumbing and Heating, (in display), bath tubs of high-grade quality now selling at the reduced price of standard grade. We also stock the extra heavy Kitchen Range Boilers which will last the life of two of the ordinary."

* * *

Kellow & Robinson, Leamington, Ont., make the following announcement: "All Settled (in display type). We are now running smooth in our new place of business, and in better position to handle all work promptly and efficiently. Get our estimates on new or repair work for plumbing, heating, tinsmithing and electric wiring."

* * *

Greenaway & Elliott, Bowmanville, Ont., in a two column advertisement, four and a half inches deep, show an illustration of themselves just coming out of the doorway of their garage in their auto already to start on a job. Below is the following: "Besides being first-class plumbers and tinsmiths we are agents for —— sheet metal building goods. Phone 18, Day or Night."

* * *

Thomas Hoare, Pincher Creek, Alberta, in a display ad. two columns wide and five inches deep, surrounded by a border, announces: "Another new venture (in large display type). Plumbing, heating, tinsmithing (in smaller display). Having opened up a work shop in town I wish to announce that in addition to plumbing and heating I am prepared to do other work such as eavestroughing, water tanks and watering troughs, of any size made to order. All kinds of tinware repairs. Deep and shallow well pumps. Installation and repair work. Auto radiator repairs, phonograph repairs, lawn mower grinding. In fact anything you may want fixed and that you don't know just where to get it done, bring it here. Shop right at the bridge, but any work left at Jackson Bros. will be attended to. I will quote prices on any job (in display)."

* * *

E. S. Coppins, Woodstock, Ont., is going out after business in adjoining territory. In the Oxford "Tribune" published at Ingersoll, Ont., he has a single column space, three inches deep, in which he announces in display type: "E. S. Coppins, 371 Dundas St., Woodstock, Ont., Plumbing and Electric Fixtures of All Kinds. Get our Prices."

* * *

Noble & Rich, London, are also after business in Ingersoll, which is located 18 miles east of London. In a double column advertisement, five inches deep, they show an illustration of a handsome bath tub with shower. Under the caption "A Nice Bathroom" in heavy display type they say: "A nice bathroom and equipment is a good feature to any house. It enhances the value and makes life a pleasure for its occupants." The cut shows you a shower bath suspended over the tubs. "This shower is a beautiful piece of plumbing. To take a shower when you rise in the morning will send you down stairs three steps at a time, ready for the chores, breakfast and work. Write us to-day for particulars. We are always pleased to let you have prices and information."

* * *

Peter & Sylvester, Stratford, Ont., devote their entire space to the following announcement in display: "Cook by Electricity. See Our Ranges."

* * *

D. N. Flander, Ingersoll, heads his advertisement "Do you need a new stove or plumbing?" and the reading matter goes on to extend an invitation to all to come and look over the stock. The advertisement closes with: "We will accept bonds in payment of purchases at this store."

* * *

Edward Mackness, Sarnia, Ont., features "Perfect Plumbing" in the heading of his announcement to the public and then continues: "If you knew the perfect nature of the plumbing work we have done for others in this community, we feel quite certain that you would have employed us long ere this. But you need not put it off longer. Send for us and get acquainted with the perfect plumbing we do. Plumbing, heating and tinsmithing estimates, cheerfully given."

* * *

J. C. Stewart, Weyburn, Sask., uses a double column space to an illustration of a deep sea diver repairing a an attractive illustration showing a three-piece bathroom set and a satisfied owner looking things over. The advertisement is headed: "Have a Beautiful Bathroom," and in display type the announcement continues: "Farm and City Home, Every Job Guaranteed, See J. C. Stewart."

* * *

The Hunt Plumbing Co., London, Ont., devotes one-half of its space to an illustration of a deep sea diver repairing a pipe a long way under water while a fish watches the work. The advertisement goes on to say: "That no matter how difficult the job is, the Hunt Plumbing Co. will tackle it and the customer is assured of the best possible service."

* * *

Marsh & Scott, Medicine Hat, Alta., in a double column advertisement, two inches deep, make the following announcement: "Marsh & Scott, plumbing, heating, sheet metal work, tinsmith and repairing, Sixth Avenue, Phone 3655."

* * *

R. A. Bond & Co., Medicine Hat, Alta., in a single column advertisement, two inches deep, say: "R. A. Bond & Co., First St., Plumbing, heating, sheet metal work. Repair work is our specialty."

* * *

Gordon Mann, St. Thomas, Ont., in a liner advertisement says: "Gordon Mann, Spohn Block, corner of West End Market, Phone 1434, Best Materials, Competent Workmen, Reasonable Prices."

* * *

Howard Statham, Strathroy, Ont., who as stated in a recent issue of SANITARY ENGINEER, handles bicycles as a sideline in connection with his plumbing shop, devotes his entire advertisement, three columns wide and two and a half inches deep, to boosting the machine he handles. He says in part: "The best Made in Canada and fully guaranteed bicycle. Supreme in material, appearance and lasting quality. The service we give after the wheel is yours is a big consideration. Come in and see our stock of bicycles, sundries and tires."

EDITORIAL COMMENT

THE SIGNING OF PEACE

NOT since the armistice has anything occurred which has so affected the markets of the world as unconditional acceptance by Germany of the terms of peace laid down by the Allies. The effects though are vastly different. The signing of the armistice brought to a sudden stop months of ceaseless activity and many looked out on the reconstruction period with no little misgiving. So far Canada has come through the after-the-war period splendidly. All over the country plumbing men report that business has been excellent and that it gives every promise of remaining so. In spite of strikes and labor troubles business in general has been good. Behind everything though there was always the doubt as to what Germany was going to do in regard to the armistice. This was reflected perhaps more in British and American circles than in Canadian business, and caused a great many projects to be held up until it was certain that there was to be no resumption of hostilities. Possibly one of the great factors in deciding the Germans was the firm stand taken by the Allies. The Hun knew that if he attempted any of his old tricks and did not sign at the time specified several powerful Allied armies in command of Marshal Foch would at once occupy German territory. The final surrender is as complete as that indicated by the armistice. The results will be immediate and far-reaching in business. The commercial world will feel free to go ahead unhampered by any more shadows of war. No country on the globe has a brighter future than Canada and big men all over the country are looking for a period of steady development that will last for many years.

KEEP WELL POSTED

NO man can know too much about the business in which he is engaged. The greatest prizes in the commercial world to-day are going to the men who know. These men, because they have the energy necessary to become posted on all sorts of details which the average man passes up as unimportant, get a wider vision which gives them a tremendous advantage. They study most carefully the needs of the buying public which they serve and not only supply them but by judicious management create new needs. They are posted thoroughly on time-saving and labor-saving methods because these things under present day conditions mean either a big saving or a big loss. By using the general knowledge which they are constantly seeking they develop the faculty of being able to think and what is equally important to act quickly. This naturally develops in the man aggressiveness in business that can be obtained in no other way. It makes them keen merchants and keen does not in any way mean that they are ready to stoop to methods of unfair dealing, but that they are quick to see the chances for trade and quick to take advantage of them. Most persons who have come in contact with the outstanding figures in the retail trade to-day are astonished at the wide knowledge they have. These men would be expected to know all about their own stores, but they frequently surprise people by the grasp they have of numerous details, most of which when analyzed will be found to have a bearing of some kind on the business in which they are engaged. There is nothing superficial about this knowledge. It is based on actual facts, because accuracy is a vital element in successful business building. Small mistakes will often wreck a business quicker than anything else and no one knows this better than the keen retailer.

SHORTER WORKING HOURS

IN view of the continued and successful demands on the part of employees for shorter working hours the experiences of some of the large British firms is somewhat interesting. These firms feared that shortening the hours of labor would greatly affect production and also decrease the efficiency of the capital required to carry on the business. In one case, two twelve-hour shifts were changed to three eight-hour shifts and it was found that the output increased. Then Lord Leverhulme, the British soapmaker, tried out the plan of having four six-hour shifts at some of his numerous factories. It is stated, that the management is confident that the men work harder per hour than under the old system and that in this way the output is increased and the working efficiency of the capital made greater. The latest British advocate of the shorter working week is Lord Northcliffe, who, it is stated, may try out a plan for a five-day week for all brain workers in his employ. Retailers all over the world are particularly interested in the move for shorter hours, as thousands of their employees are watching what is happening and are making their demands from time to time.

NEEDED LARGER VISION

THE question is often asked why Government operated enterprises cannot be operated as efficiently as privately owned businesses. Some clue to the answer may be shown in the figures which follow. The United States Railroad Administration, which controls properties valued at more than twenty billion dollars, recently decided to expend $1,000,000 in advertising for passenger travel. At the same time came an announcement that the tea associations were going to spend at least $2,000,000 to stimulate tea drinking and that one sugar company was preparing to spend $2,500,000 in advertising. Neither the tea firms nor the sugar firm are in a class with the railway organization when it comes to capitalization. The handling of the railways, moreover, bears closely on the prosperity of the entire country, and yet those directing affairs probably thought they were doing something really big when they decided to spend a million for advertising. One reason apparently why Government enterprises usually are not a success is because the men at the head of affairs are not big enough men or men with a broad enough vision to see the needs of what they are directing or its possibilities of development. Those in charge of the railways realized that they ought to advertise. They will get results from their advertising too, but they will not get the full results because they have not realized the importance of what they are trying to do. If the men who planned the sugar firm's advertising or that of the tea companies, had the work of laying out a campaign for a $20,000,000,000 corporation they would limit the expenditure to a million. It is just because big men undertake big things that they get big results. The same thing applies in proportion to every retailer. The man who expects to build a big business by using a one-inch space once a week, giving his firm name only and not telling the people anything about what goods he has to offer, may get some business as a result of his advertisement. But, imagine how much business the mail order firms would get if they depended on that sort of advertising, or what the turnover of some of the big retail stores would be if they limited their advertising appropriation to a dollar a week.

HIGH WAGES AND BUYING

ONE of the greatest changes that merchants and manufacturers, looking out into the new world that has followed nearly five years of war, find is the radical advance in wages. These have been so general as to affect the whole commercial fabric. One result of the high wages in Canada during the war period has been to make business in general, and the plumbing business in particular, especially good. The plumbing trade was perhaps never in its history on so sound a basis as at present. So far business during the reconstruction period, while perhaps quiet in a great many respects has been in a thoroughly healthy condition. There is every indication that it will remain so and that strikes and other disturbances are not going to have any really serious effects. As a result of the high wages that have prevailed the buying power of the general public was tremendously increased. The average man has been making good money and he has been spending more than ever in making his home a better and more comfortable place, or in buying things that will enable him to do his work quicker and more efficiently. Now that he has learned what he can do, it is safe to say that his tastes from a buying standpoint have been raised and that he will continue to be a better buyer than he was before. One of the very largest buyers in the Dominion to-day is the farmer and he is likely to remain one of the premier purchasers. Taking a general survey of the outlook indicates that the plumbing men are likely to be large gainers as a result of the higher wages. Will wages decrease? There is no chance of this apparently if organized labor can prevent it. Little by little conditions are becoming stabilized and things are getting back to a normal basis as far as volume of business is concerned.

MEANS LARGER BUYING

THE last issue of the *Labor Gazette* gives some interesting figures showing how wages have advanced in the past year. The statistics also indicate that there is little lack of employment this season, as compared with the same period a year ago when things were very busy and help scarce. In Montreal in April of 1918, 4,916 temporary workers in the first fortnight received in wages $90,352.12. In the same city during April, 1919, 4,417 temporary workers received in a fortnight $129,603.88. This indicates the much higher schedules in effect and the figures in other places show that the increase is general. In Victoria, for instance, in April, 1918, 200 workers received in wages $7,369.63, while in April, 1919, 198 workers received $9,019.80. At St. John, N.B., 247 workers received $8,161, as against only $7,627.27 received in the same period a year ago by 267 workers. All this has an important bearing upon retail trade in all its branches. People are making more and are spending more making full allowance for the fact that commodities have advanced. The average man is living better to-day than he ever did. The section of the buying public hit hardest by the increased cost of merchandise are the fairly well-to-do people working on a fixed salary, or those people who have money invested and receive from it an income that does not vary appreciably. These people have had to curtail their buying, while on the other hand, the average worker has been buying as he never bought before.

News from Here and There

CONTRIBUTIONS OF NEWS GLADLY ACCEPTED

LOSS IS $50,000

Fire, which started in a storehouse of the R. McDougall Co. at Galt, Ont., spread to the pattern shop, destroying both buildings and causing a loss of $50,000. The firm manufactures pumps and tools.

LAVATORIES FOR BEACHES

Residents of the Beaches district, Toronto, are bringing the lack of public conveniences in that section of the city, which may almost be called a summer resort from the number of its summer residents, before the city council.

PUBLIC CONVENIENCE FOR GUELPH

Guelph, Ont., is seriously considering the installation of public conveniences in the basement of the City Hall. These would have outside entrances, illuminated at night.

MONTREAL BUILDING BY-LAW

Montreal's building by-law, which has been under consideration for the past eight years, is nearly ready for adoption. The draft of the by-law is at present being submitted to the Engineers' Institute, Architects Association, as well as the Plumbers' and Builders' Associations and the Fire Underwriters.

Details are not yet available, but it is known that the by-law will be published in both English and French.

TENDERS

Sarnia, Ont., ratepayers will vote on a by-law on July 14 to provide $350,000 for a new combination technical school and collegiate institute.

The Greenfield Land and Construction Co., 225 St. James St., Montreal, plans the erection of four $4,000 residences.

Tenders will be called shortly for the erection at St. Thomas, Ont., of two new six-roomed public schools.

The McEachern Construction Co., of Toronto, has commenced the erection of twenty-five new dwellings at Leamington, Ont.

W. J. McFadden, Durham, Ont., has commenced work on two new dwellings. Plumbing to be let.

George W. Beatty has commenced work on a business block at Forest, Ont., to cost $10,000. Plumbing to be let.

The Hospital Board at Galt, Ont., is calling for tenders for a new home for nurses to cost $30,000.

The Republic Motor Truck Co., of Alma, Michigan, is preparing plans for a Canadian branch factory at London, Ont., to cost $150,000.

Wilbur R. Webb, 537 Greenwood Ave., Toronto, is receiving tenders for the erection of four bungalows to cost $16,000.

John McCormack, 364 University Ave., Montreal, will let plumbing and heating contracts for new twelve-flat residences, costing $20,000, for the Lakeview Land Co.

DEATH OF L. T. HUNT

The death occurred at Rochester, Minnesota, following an operation, of L. T. Hunt, hardware and plumbing, Thorold, Ont. Mr. Hunt was for some years in business at Alvinston, Ont., but about ten years ago went to Thorold and took over the business of the late C. N. Stevenson. His son, W. H. Hunt, was engaged in the business with him. Mr. Hunt had been ill for more than two years.

HISTORY OF WAR PRICES

A history of prices during the war, covering the whole field of prices from the beginning of 1913 to the end of 1918, is announced for publication in the form of a series of bulletins by the Price Section of the United States War Trade Board.

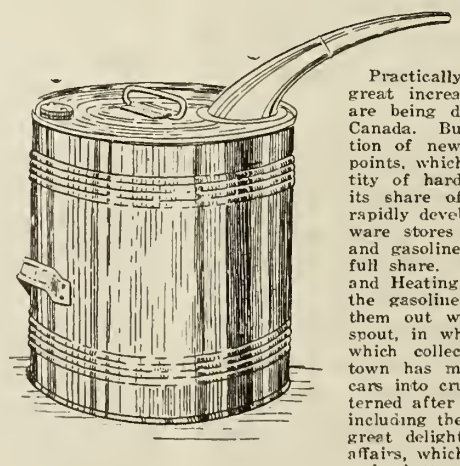
The bulletins now in press were designed especially to the needs of business men by their division into 50 important industrial classes. There is, for example, a complete price inquiry of interest strictly to cotton men, and one for each important class coming under the general head of food, clothing, rubber, paper and fibres, metals, fuel, building materials and chemicals. The history of prices during the war, which, when finally printed, will include 57 bulletins, will be issued piecemeal.

LEADING FIGURES

David K. Trotter, secretary of Local Union No. 144, Montreal, sent the following letter to the Montreal "Gazette":

"To the Editor of the "Gazette:

"Sir,—At a meeting of the Master Plumbers' Association of Montreal and vicinity held here to-day, exception was taken to statements in an item published in yours of yesterday under the caption, "The Plumbers' Union." There it is stated that 'the scale of wages (for plumbers and steamfitters) is from 30 to 35 cents an hour,' and further, that 'no increase in wages has taken place during the last four years commensurate with the higher cost of living.'



Selling Lots of Gasoline Cans

Practically all trades are benefiting from the great increase in the number of automobiles that are being distributed among farmers in Northwest Canada. Building material is required for the erection of new garages that are being erected at all points, which entails the need of a considerable quantity of hardware. The blacksmith trade is getting its share of repairs, and, indeed, blacksmiths are rapidly developing into expert repair men. All hardware stores are going in for auto accessories, oils and gasolines, while the tinsmiths are reaping their full share. The proprietor of the Yorkton Plumbing and Heating Company stated that he was selling all the gasoline cans he can manufacture. He turns them out with an exceptionally long funnel-shaped spout, in which is placed a fine meshed wire screen which collects all dirt. Another tinsmith in this town has made quite a success of converting Ford cars into crude racing models with a new body patterned after that used on the speedways to the south, including the wasp tail. The younger farmers take a great delight in running into town in these rakish affairs, which not only have a sporty appearance, but make better speed over country roads with the load placed closer to the ground.

"The officials of Local No. 144 who released this particular information must have been asleep on their jobs during the past four years; or, if new ones, they have not been thoroughly coached in conditions presently prevailing.

"These are the facts: First-class plumbing and steamfitting firms in Montreal (and they are many) were paying competent mechanics in these trades in

	Per hour
1915	37½ cents
1916	40 cents
1917	42½ cents
1918	45 to 50 cents

while a month ago this association recommended its members in view of the increased cost of living and the rise in wages that was taking place in other branches of the building trades to pay first-class plumbers and steamfitters up to 60 cents per hour.

"In justice to the master plumbers of the city, I trust you will give the same publicity to this statement as was given to the one complained of.

DAVID K. TROTTER,
Secretary.

ELECTRICAL BUSINESS DEVELOPING FAST

Continued from page 19

their homes and their stables by electricity, and in, addition have provided for their wives' taking advantage of the power by getting electric washers, electric cleaners and many other electrical appliances. The number of farmers enjoying these comforts is growing far faster than those not in touch with the sales have any idea. And those in the trade state that they will continue to grow because electricity has demonstrated beyond any question of doubt that it is a real servant, and does its work quickly and economically.

Tell One Another

Electrical devices very often sell themselves. They are obviously so efficient and so simple that anyone can see their value. And people have not been slow to appreciate the value of a helper of this kind, especially those who have been having trouble in getting hired help. No woman who has ever used an electric iron, or an electric washer or an electric vacuum cleaner ever wants to go back to the old methods. She is not only satisfied with her electric helpers but she is a tireless booster for them among her friends. This is perhaps one of the main reasons why electric goods are selling so fast. It is also one reason why so many dealers have been quick to see the opportunity and take advantage of it. The sanitary engineer comes into close personal touch with the homes in his community, and when they find a demand for goods that will render real service in the homes they are right there to look after all the business that is offering. Electricity has, perhaps, done more in the past ten years to make the homes of Canada better and more comfortable places than any other agency. It is also doing more to take the drudgery out of housework than any other agent. Not only this but it has shown people miles out in the country and away from power lines that they can have at small cost all the electrical conveniences that are to be found in the most expensive city homes. Is it any wonder then that the demand for electrical goods of all kinds is growing by leaps and bounds?

Because building has been held back for nearly five years the sanitary engineers have not been able to do anything like a normal trade in fixtures. Now, however, with the building all over Canada showing a steady increase there are going to be some splendid chances for business. Every home that is built, almost, offers more or less prospects for fixtures. Certainly every home that has electricity in it offers prospects for more business. The mail order firms have been making a big drive in the electrical business of all kinds, both fixtures and utilities, and they have got results. The local dealers, however, have been handling a big share of the trade, selling more in the aggregate, it is stated, than either the straight electrical dealers or the mail order firms. The sanitary engineers now are one of the big factors in the distribution of electrical goods and they are steadily increasing their sales.

"There is a big and steadily growing demand in all parts of the Dominion for electrical fixtures," stated one large distributor to SANITARY ENGINEER. "Owing to conditions during the past four years there has been nothing like the opportunity for selling electrical fixtures that there will be from now on With the revival of the building business there will be splendid chances for the sanitary engineer to sell fixtures. They handle general supplies, sockets and so on, and handling electrical fixtures is a logical development. People all over the country who are building houses will require a lot of electrical fixtures and equipment, and there is a splendid opportunity to get this business. It is a perfectly legitimate class of business for the sanitary engineer to go after. The mail order firms sell thousands of dollars' worth of fixtures every year to people all over the country, who buy from the mail order houses and then get a local electrician to put them up or put them up themselves. If the local dealers will go after this business it is theirs and they should go after it because it carries a good profit, it is a nice trade to handle and the fixtures make an attractive showing in the store."

Another source of business is that offered by the farmer according to this distributor who dealt with this phase of the question as follows:

"There is a big demand from the farmers for electrical labor saving equipment of all kinds, and it is going to be a lot bigger. In Ontario the electrical lines are being extended to all parts of the province. In the Northwest, where there is no such power available, we find a large increase in the sales of home power plants. This business is growing fast and it brings with it the sale of utilities as we supply connections and equipment by which the farmers who have their own power plants can connect up with the washing machine or other devices.

"Never in the history of the business," this factor pointed out, "has there been such an advertising campaign as is now being put on by makers of the various appliances. In the big American magazines they are using pages of space each enormous interest on the part of the buying public and this is being reflected in Canada. We can notice more results now than were apparent a year ago."

Electrical fixtures and supplies lend themselves to attractive arrangement and by following up the displays with aggressive sales work of the right kind, the dealer will find this a department which responds quickly to a little energetic development.

CANADIAN GAS CONVENTION

The annual convention of the Canadian Gas Association will be held at the Clifton House, Niagara Falls, on August 21st and 22nd. An excellent program of papers is being arranged. The officers of the association are C. C. Folger, Kingston, Ont. president; V. S. McIntyre, Kitchener, Ont., vice; C. S. Bagg, Montreal, 2nd vice; George W. Allen, secretary, Toronto; and executive committee, J. P. King, Stratford, Ont.; Arthur Hewitt, Toronto; J. S. Norris, Montreal; A. A. Dion, Ottawa; E. H. Caughell, St. Thomas, Ont.; J. M. H. Young, London, Ont.

—Briggs in Chicago "Tribune."

WHEN A FELLER NEEDS A FRIEND

When your father takes you to the circus, and, just as you get to the entrance and you hear the band playing for the grand opening pageant, father meets an old-time friend.

Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

LOCATION OF RADIATORS

Question:—I have a client who wishes to have the radiators in his new house placed against the inside walls. He says that a fitter told him that the belief that radiators were better against an outside wall was only superstition, and that he could show him lots of places where he had put the radiators on the inside walls, with excellent results. What is your opinion?

Answer:—Our opinion is that a radiator should be placed in the coldest part of the room. The coldest part of the room is ordinarily close to a window or an outside door. The faster the air circulates around a radiator and the greater the difference between the temperature of the heating surface and the air, the more efficient is the radiator. Another thing, if the radiator is against the warm inside wall the warm air above the radiator will ascend to the ceiling and down the outside wall, where it becomes cooled. Then this cold air passes over from the outside walls across the floor to the radiator where it is again warmed. The result is that it is always quite cold at the floor line and too warm at the head. Everyone knows that such a condition of temperature is anything but conducive to physical well-being. When radiators are placed against inside walls, and no complaints have been registered by the occupants of the rooms it is a pretty good guess that the rads are in rooms not much used as sitting rooms or offices. The only argument in favor of putting radiators against the inside walls is one of economy in the cost of installation.

UNBALANCED CIRCULATION COIL DOES NOT HEAT

Dear Sirs:—

Kindly give me some advice on this job that I am sending you a rough sketch of, as we find that the coil does not heat properly but the range boiler heats fine.—Yours truly, Nova Scotia subscriber.

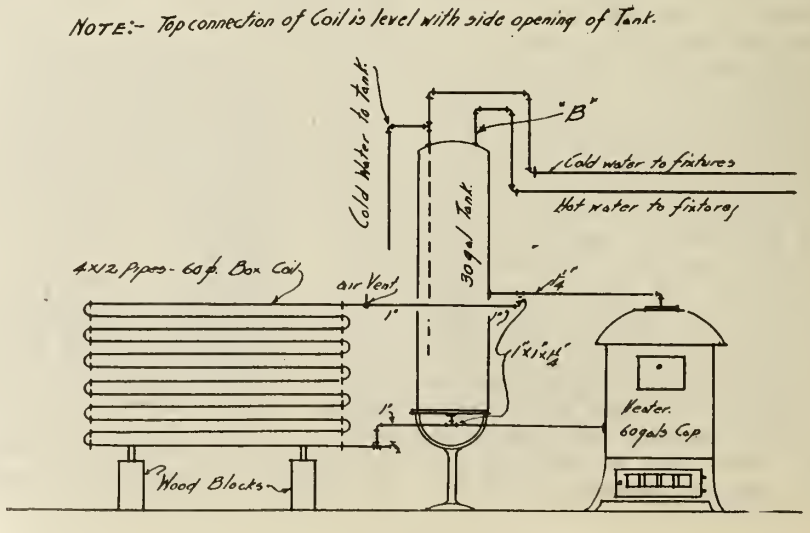
Answer.—Unless the draw from the tank is less than the average, or that the coil is larger than might be actually required in a 60 gallon tank heater is not large enough to be properly connected to the load represented by a 30-gallon domestic tank and a box coil of 60 square feet of radiation. Under ordinary circumstances all that a heater of that size could be used for in addition to the 30-gallon tank would be a surface equivalent to 45 square feet of direct cast iron radiation. However, it is evident that the principal difficulty experienced in the operation of this system is the faulty circulation due to an unbalanced arrangement of piping.

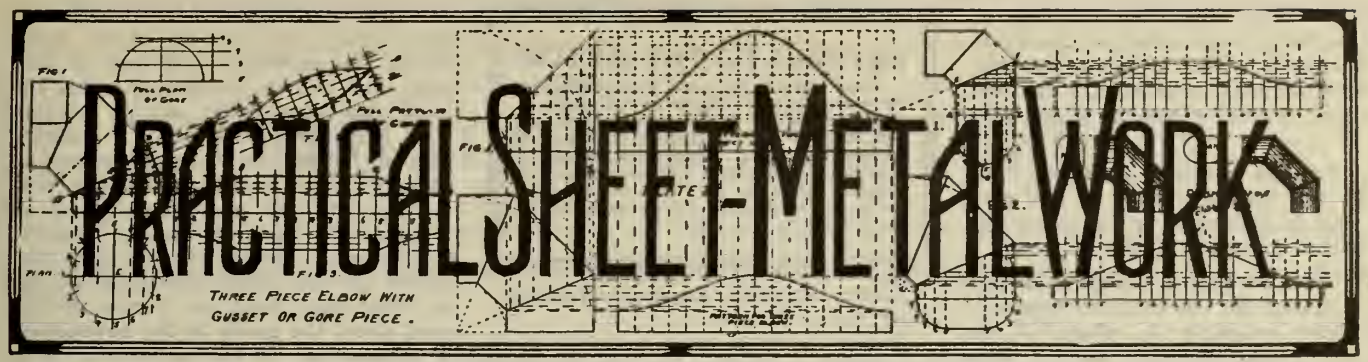
We would recommend that the side opening in the tank be plugged, and that the hot water feed from the heater to the tank, fixtures and coil be connected by way of a tee in the pipe marked "B." When connecting the feed to the coil keep it a little lower than the highest part of the branch leading to the fixtures and then it will not be necessary to provide air vents.

It would be well to lower the horizontal pipe running below the tank so that the return from the tank would be a little lower than the return from the coil. In fact it would be better to drop that return line down close to the floor so that there would be a decided riser where the return connects with the heater. In the work of connecting radiators to a domestic water supply a rare degree of care and skill is required; much more so than in ordinary steam fitting practice. Watchfulness must be exercised at every turn to guard against too easy a flow through any part of the system at the expense of some other.

The way the installation is made as indicated on the accompanying sketch, the pipe coil is just setting to one side of the circulation, and as the flow through the tank is so much favored by the present system of piping the water in the coil may be considered as being in the same condition as the water in the back eddy of a running stream. Even the best balanced heating system of this kind is bound to be subject to certain fluctuations in the degree of service every time hot water is drawn from a fixture. When a hot water tap is opened the cold water runs into the bottom of the tank and sets up a disturbance in the circulation that often arrests for a time the return of water from the radiators.

Continued on page 21





ONE of the most useful pipe fittings in furnace construction is that of an offset boot. It takes the place of a round to rectangular piece as well as an elbow in many cases.

For instance, if a straight round to rectangle piece is used, and the warm air pipe has then to be turned to the horizontal, this horizontal pipe will be much lower down than would be the case if an offset boot be used.

Then an angle elbow can be used, too, under certain conditions, which would reduce friction in the warm air pipe line.

This pattern is developed by the triangulation method, though the plan is not used in this case. No matter what size or proportions of a filling is required, the method here described can be adopted.

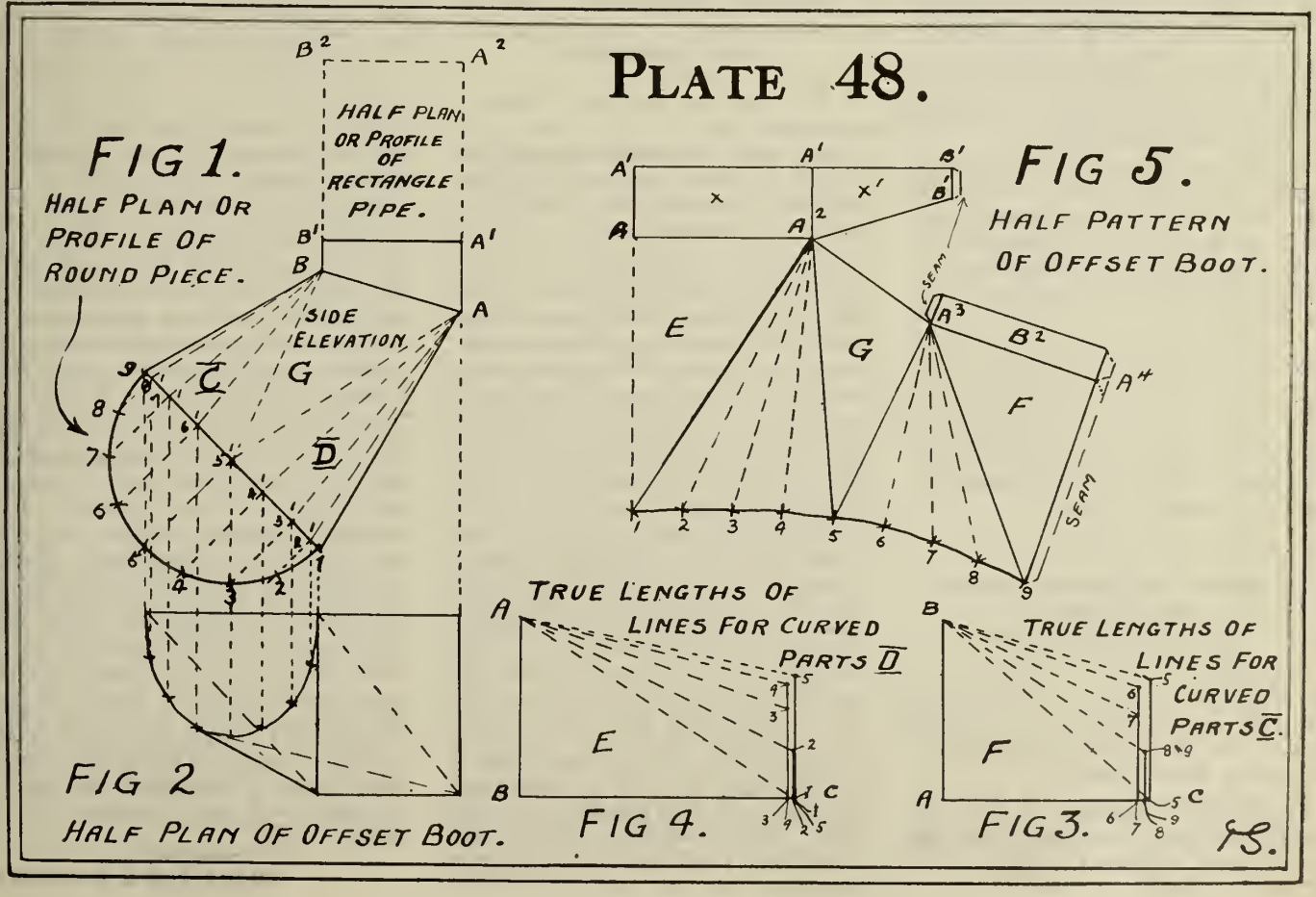
First draw the side elevation shown in Fig. 1—B^1, A^1, B, A, 9, 1. and determine centre of line 1 as at 5. With 5 as centre, draw the half circle, which is really a one-half profile of the round piece and takes the place in practice of the half plan of round part of the fitting. From B^1 and A^1, draw the half plan of rectangular piece, as shown, at B^2, A^2, which may be any desired length. Fig 2 shows how a half plan of the boot may be developed, though it is not required in this case, but is shown merely for practice in striking off a plan from the elevation of an irregular shaped article.

Next divide the half profile of the round piece into eight equal parts, 1, 2, 3, 4, to 9, and draw dotted lines from these points at right angle with line 1. 9, which now becomes the base line of piece to be developed, intersecting same as shown by 8^1, 7^1, 6^1, 5^1, 4^1, 3^1, and 2^1.

Next draw dotted lines from B to 3^1 to 5^1, and from A to 5^1 to 1, the portion marked G between points A, B and 5, will be flat, while the rest will be formed with a circle.

Now turn to Fig. 4. This diagram shows the true length of the portion that is curved with the half elevation for the lower part of the boot.

First draw a vertical line, A, B, the height equal to half the length of the rectangle piece, and from B draw a horizontal line at right angle to A B, the same length as the line A 1 in Fig. 1. thus establishing three points A, B, C. Now draw a dotted line connecting A with C; this is the first true triangular line developed. Now place the compass point at 2^1 on base line in Fig. 1, and open to point 2 on the circle, transferring this measurement to C in Fig. 4. Next open compass and transfer measurement between point A 2^1, Fig. 1 to B C on Fig. 4, thus securing point B 2 on horizontal line. From 2 draw a vertical line equal in length to the distance between 2^1 and 2 in Fig. 1; repeat these operations until all the distances have been transferred. Then draw a number of dotted lines from point A to the top



of short vertical lines shown in Fig. 4. These dotted lines are the true length of the triangular lines to determine the length of material required for the one lower side, or rather quarter of the pattern.

Fig. 3 shows the true length of lines for the top quarter section of the pattern, and is developed by following out the method described in Fig. 4.

Now turn to Fig. 5, which is a full half pattern, for the fitting required. First draw rectangle X, which is the half plan of the rectangle piece. Next draw X^1, which is the side elevation shown at B^1, B, A^1, A, in Fig. 1. The two, X and X^1 are the half pattern of the back and sides of the rectangle piece, while B^2 is the half pattern of the front of rectangle piece.

The next step to take is to transfer the true lengths described in Fig. 4 to their place on A and A^2. Place compass point at A in Fig. 4 and open up to C, this measurement to be transferred to A^2, 1, repeating this operation until all the dotted lines have been transferred from Fig. 4 to Fig. 5, A^2, 1, 2, 3, 4, and 5. The distances between the last named figures are determined by cutting each small arc, 1, 2, 3, etc., with the measurements procured on the half circle in Fig. 1.

Section G is now to be developed. Place the compass at A^2 and draw an arc at A^3, cutting same by placing the compass point at 5, using a measurement equal to length of dotted line shown in Fig. 3, B, 5^1.

Now follow out the same operations in transferring all the dotted lines from Fig. 3 to A^3, 5, 6, 7, 8, 9, in Fig. 5.

By connecting each of the points procured, 1, 2, 3, 4, to 9, with a solid line, the curved stretchout portion for round part of pattern is complete.

Now to develop part F. Place the compass point at B in Fig. 3, and open to A. Then draw arc A^4 by placing compass point at A^3, Fig 5. Next cut this arc by transferring the measurement A, C, from Fig. 3. By joining points 9, A^4 and A^3, the complete half pattern for boot is developed.

By turning over the pattern at 1, A, A^1, a full pattern is procured in one piece, which would be seamed at line 9, A^4. If, however, it is necessary to make the fitting in two pieces, an extra allowance of metal will be required at portion of pattern A' and 1.

MARKET CONDITIONS AND TENDENCIES

Continued from page 36

ANTIMONY.—Another advance of 1 cent has been recorded in the prices of antimony, and quotations are now being made at ten cents, with a good volume of business being handled.

ALUMINUM.—Business in this commodity has been somewhat quiet and prices remain stationary at from 40c to 42c per lb. Stocks are plentiful.

LETTERS TO THE EDITOR

These columns are open to contributions upon any topic of interest to the trade, it being understood that the views expressed are those of the contributors, and do not necessarily imply editorial indorsement. Names of contributors will be withheld, if desired, but name of writer must accompany correspondence as an evidence of good faith.

Editor, Sanitary Engineer, Toronto:
Dear Sir:—

Having heard so much recently about reconstruction during the war I naturally look for something doing in the trade along that line. Now the trade does and should take the stand that it should not work for nothing, but, say boys, how about telling the general public what they are paying for? The medical profession tell the world what they have done to make Jerusalem and Bagdad fit to live in, how they made it possible to put through the Panama canal. The biggest thing done by them was to turn a flock of plumbers loose who did all the work, and the M.O.'s took the credit for same.

Now, how about educating the trade up to a level where they have data for the difference in health after sanitation has been installed in said places? Also in schools where modern plumbing has rplaced old systems. In work shops where new installations have been made, and generally to claim half the credit which the medical profession claims for itself, then work will come and prices will be a secondary consideration. How about making the public know that our trade is as, or more, important than the medical profession?

More Again "Ratsy."

Editor, Sanitary Engineer, Toronto:
Dear Sir:—

I read with considerable interest the article in the June 1 issue of SANITARY ENGINEER entitled, "Says small town plumbers are passing up fine opportunity for a lot of good business." There is undoubtedly a good deal of force in what the manufacturer says about there being opportunities for selling more goods in the farm homes. When he compares the methods of the piano salesman or of the sewing machine agent to the methods of the plumber, though, I differ with him. He apparently does not take into account the fact that both pianos and sewing machines carry a margin of profit that is very high. I am told that four hundred per cent. is not an extreme profit on many of the pianos. Selling with a high profit like this enables the piano salesman or the sewing machine man to take a few dollars down and then so much a month. A great many people will buy goods on this plan who would not buy if they had to pay all cash. The plumber is not in a position on a margin of profit that runs from ten to fifteen per cent., very often a good deal less, to go to a farmer and say, "Here, you need a bathroom in your house. Give me $25 down and so much a month and I will put it in." In most cases there are too many people after the work, and there is a lot of price cutting. Price cutting is one of the worst things the plumbing trade has to contend with, and in the smaller towns the local man very often has to compete with firms from the cities. Another point in connection with the matter is that the piano salesman and the sewing machine man have behind them an organization that believes in extensive advertising. Many of the prospects they follow are the direct results of inquiries that come from the parties having read about the goods in the newspapers or magazines. If the manufacturers of the various household necessities in plumbing goods were to advertise as extensively as the piano firms or the phonograph makers or the sewing machine companies, and then co-operate as closely with the plumbers as these other firms do with their agents I think sales could be very largely increased. In the meantime more co-operation between the men in the trade and the manufacturers would help. Many of the manufacturers do not protect the plumbers at all. I know of instances where farmers and others in my district have gone down to the Toronto Fair after being told by the local man all about what would be the best goods to instal, and then the manufacturers' representatives at the fair sold direct to the party. The plumber, after one or two experiences of this kind, is not very enthusiastic about putting business in the way of a manufacturer who never even says "Thank you." The great trouble with the plumbers to-day is that they are not business men. The great majority of them have gone into the business without any knowledge whatever of business. They are good, efficient workmen, but all they know is plumbing. There are scores and scores of good men who have put in all their time and experience for years, only to find at the end of that time that they have been working for nothing, not even making a decent living. There have been other cases where the men not only put in their time and experience but any little money they may have had as well, and come out with nothing to show for their work. Not only are these conditions far more general than those who are not in touch with the trade would believe, but plumbers generally have not been sufficiently self-respecting. They have been distrustful and suspicious of one another, and in many cases have said extremely hard things about one another. Because we have called ourselves names other people have called us names. If a man called a plumber a thief and a robber, in most cases the plumber smiled and walked away instead of resenting it and making the party take it back. There has been too much altogether of this sort of thing, and until the plumbers put a proper estimate upon themselves they cannot expect others to do so. It is a funny thing, but none the less true, that plumbing and heating, two of the most important matters as far as life in populous centres is concerned, are two of the most poorly paid businesses in the country to-day.

Yours truly,
SMALL-TOWN PLUMBER

Heating and Ventilating

CHARTS

Seventh Article of Series Prepared for Readers of "Sanitary Engineer" by N. A. Kearns

Editor's Note.—This article is the seventh of a series prepared especially for the readers of SANITARY ENGINEER, covering heating and engineering practice reduced to its simplest terms. Readers will find this article on the "Details" a most interesting and illuminative one. The first article of the series appeared in the April 1 issue. Descriptions of installations made in different classes of buildings will be given, together with the method used in making the designs for these installations. It is not our purpose to give complicated formulas, but rather to present the simple rules that have been based on these formulas, in such a way that the reader will be enabled to design a heating and ventilating system without having to refer to the data given in engineers' hand-books. The author of these articles, Mr. N. A. Kearns, has designed heating and ventilating equipment for all classes of buildings in practically every province of the Dominion. Some of the buildings were such that the heating and ventilating equipment had to be installed under the most adverse conditions, whereas in other buildings the design for the heating and ventilating equipment was incorporated in the constructional drawings. The eighth article of the series will appear in the next issue.

THE working drawings and specifications prepared by an engineer are by no means the only diagrams made by him in doing his work. Working drawings illustrate only the result and thought in the mind of their author, and do not indicate in any way the problem that he had to solve; nor do they trace the paths taken by his thoughts in coming to certain conclusions. The reader must understand that a man in the habit of conveying his thoughts to others by means of the pencil, becomes so used to the feel of the pencil in his hand, that it is second nature for such a man to mark down every step taken by him in his task, and in the course of time he depends less and less on the written or spoken word, and by means of a system of signs and charts finds that he keeps his mind concentrated on any particular phase of his subject, or that with ease he can run back over the ground he has already covered and pick up the neglected points with a great deal more facility than if he had to find his way through a maze of words or figures.

The careful student keeps a pencil in his hand to continually mark the point that he wishes to remember, and finds that the use of the pencil keeps the mind on the work. This experience is enough to show how valuable his eyes are, and when he remembers that the written word is only a substitute for the language of the ear, and not for the eye, he must surely come to the conclusion that a pictured representation of the subject is of much more value than the most lucid description of the same thing.

When structural engineers are designing roof trusses, it is usually their practice to draw what is known as a "stress diagram." They mark down, by means of a scale, a line representing a certain force, the length of the line being proportioned to the value of that force, and the direction of the line indicating the direction of the force. Then they set against it a line or lines representing certain contributory or counterbalancing forces, also drawing these lines by scale measurement. When the lines are arranged so as to "close the diagram" the scaled measurement of every line, as controlled by the circumstance of the design, indicate the proportionate value of each force. Mathematical calculations could be made so as to give the same results as those of the stress diagram, but such a method would necessitate the use of figures and formula that could hardly be remembered by the ordinary mind. The use of stress diagrams is mentioned here to illustrate how a fairly complex mechanical problem can be solved by the simple means of graphic analysis.

Business executives have taken a leaf out of the book of the engineer's practice of making charts, and some of these executives appear to carry the system of charting to points beyond reason. But even the abuse of such a good thing as the graphic system only proves how valuable thing it is when properly used.

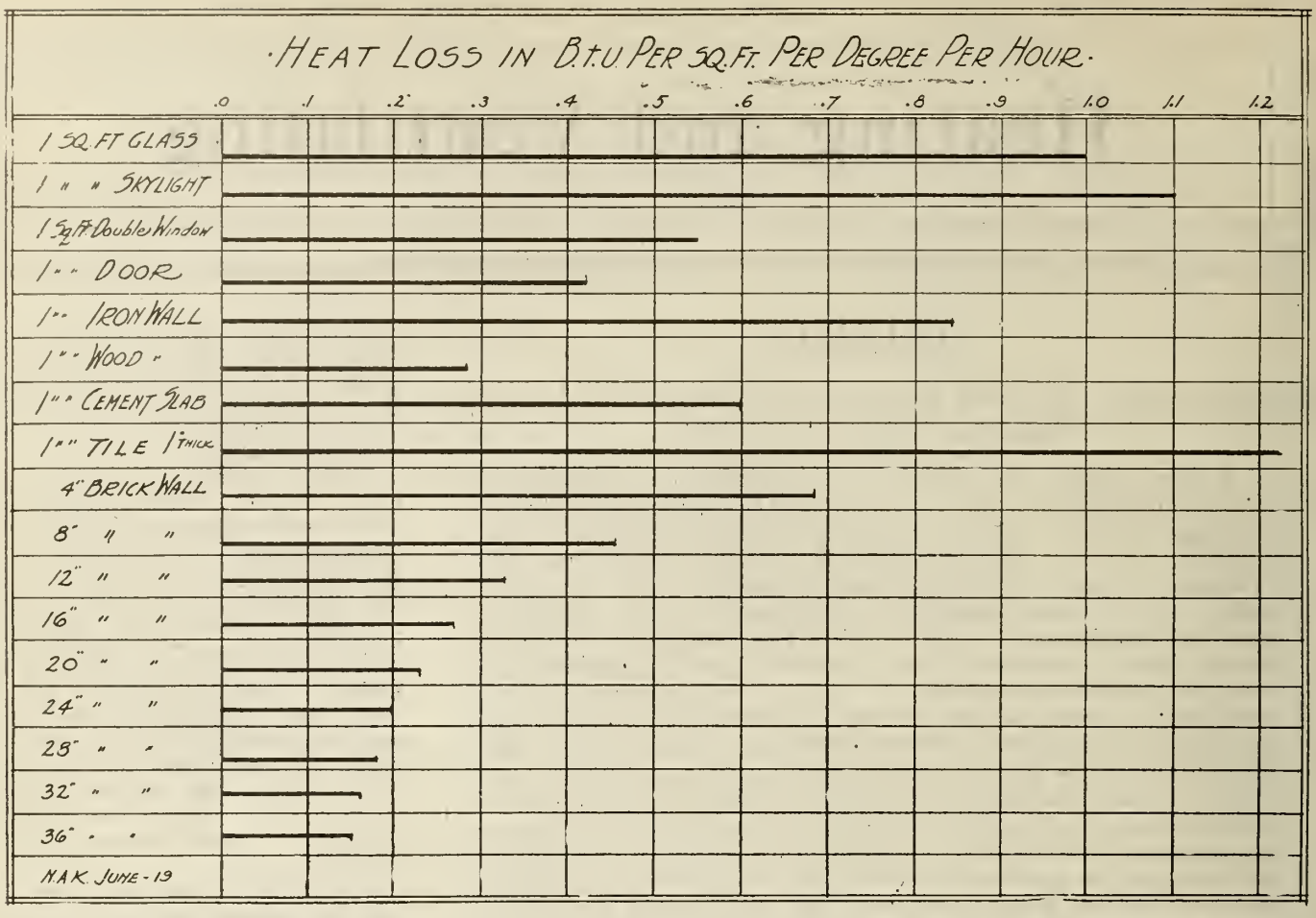
When the student has had some experience in making charts he will discover many fields where they can be used to advantage, and it is just here where the danger lies. The temptation to use charts to the exclusion of everything else may result in the making of the chart the object, instead of the instrument.

A chart has nothing to do with the working drawing except in so far as it is an aid to clear and definite thinking. It may take many forms, and in some of the well-known systems can be read by anyone that understands the use of such, but most designers have their individual systems and their charts can only be understood by their originators. If charts are made for the purpose of keeping records or for the purpose of conveying information they must be made in accordance with some uniform standard of practice.

In endeavoring to live up to our promise to steer clear of formulas we may find it necessary to give graphic charts from time to time, so as to avoid the use of more extended calculations, so we believe it is advisable at this stage of the series to show how a chart may be made and how some of the others will appear.

The reader will remember that in the April 15th number of the SANITARY ENGINEER a graphic indication of the proportionate value of the B.T.U. compared with one pound of water with one square foot of glass, etc., was followed by an article on the value of comparative standards, and the chart herein shown illustrates again in a graphic way the heat losses through various materials in B.T.U. per square foot per hour, and sets comparative standards for the materials mentioned.

In the chart each division marked by a vertical line represents one-tenth of a B.T.U., and when using the chart to figure radiation the area of the mater-



ials in square feet should be multiplied by the figure given at the top of the corresponding column, and the result should be multiplied by the temperature range to find the total heat loss, and to this total heat loss there should be added factors as follows:

10 per cent. for northern or windy exposures.

10 per cent. if heated in daytime only and if the building is not exposed.

20 per cent. if the building is heated in daytime only and is exposed.

30 per cent. if building is heated only at intervals.

When the reader refers to the chart he will note that there is one line much longer than any of the others, and in running his eye back over the line he finds that one square foot of tile 1 in. thick is a very poor heat insulating material. If we had said that one square foot of tile transmits .13 B.T.U. more per hour than the same area of window glass it is unlikely that the difference would be remembered, but when the same difference is shown graphically the proportion is presented with force sufficient to make the point worth remembering. It will also be noted that adding extra thickness to a 16 in. brick wall has very little effect from the standpoint of heat conservation.

This chart gives only constants for a few materials and the reader should make a chart along the lines of this and keep adding proportionate scales of value to it when he has the opportunity, as with the increased cost of building the use of new forms of material in construction is to be expected, and the heating engineer should be in a position to show his client why he should, or should not, use certain materials in his walls or in his roofs, and if the engineer has a chart of the heat transmitting value of the material specified, he can use that chart in showing the reason for the amount of radiating surface necessary, and presenting his argument in a graphic form he will have no difficulty in pointing out to his client the relative value of materials. It is quite within the province of the heating engineer to take up such a matter with his client, and if he does not he may find that he has lost the commission of installing a heating plant proportioned to the construction; and that he has lost it to some party that has not allowed for conditions that might have been brought to his attention had he made use of a chart such as that given.

Charts are made often for business purposes, showing from day to day how a certain margin of profit must be made to keep above the line known as the "danger mark," and if for some reason or other the profits fall near the "danger mark," the management are aware that some energy must be exercised to lift the line of profit to a point high enough to make up for the depression or otherwise they must drift into bankruptcy.

WATER SHORTAGE AT NANAIMO, B.C.

According to reports appearing in the local press, the water situation at Nanaimo, B.C., is a very serious condition. The city council has appointed a water committee to deal with the matter and they are facing the situation in an energetic way. During the month of May an inspection of the entire system has been carried out. This inspection included every house in the city, and it is hoped that with all leakages repaired and every effort being made to stop wasting water that 25 per cent. will be added to the city's supply. This will not mean an adequate water supply or proper fire protection but will avert a water famine.

The cause of the trouble appears to be that the present pipe line from South Forks to the city is inadequate and that an additional pipe line must be laid. This must be done at once, it is urged, and every effort made to finish this year. So far one of the great deterring elements to the extra line has been the cost.

RECENT REGISTRATION

L. Dalcourt has registered as a plumber in Montreal.

Ventilating the Modern School

Sixth Article of Series Written Especially For "Sanitary Engineer" by N. A. Kearns—First Article of Series Appeared in April 1 Issue

REFERENCE has been made in this series of articles to the necessity of conditioning the air. The reader may question the necessity of installing anything more than that part of the apparatus that is to be used for anything more than that of the purpose of heating the air to the required temperature and to the conveying of it to the different parts of the building. His argument might be that fresh outside air requires no other treatment than that of the changing of its temperature during the cold weather.

Now, while it is true that most school buildings are situated in districts so free from dust that the installation of air washers might seem unnecessary, it is, nevertheless, a fact that where these are installed they have more than paid for themselves in the higher standard of air conditions found throughout the building. It is not only for the purpose of removing organic matter that their installation may be recommended, but also because they serve as humidifiers, and, under some circumstances, as cooling apparatus.

In taking up the subject of "Relative Humidity," it might be well to call attention to the fact that many heating engineers and physiologists lay greater stress on this than they do on almost any of the other phases of their science. There is no room for dispute when stating the fact that a person is quite comfortable in a room when the relative humidity is maintained in proper proportion to the temperature, even though the room in which he may be confined is heavily charged with carbon dioxide. And, on the other hand, even though the air in the room may be relatively pure a great deal of discomfort is experienced when the relative humidity is either too high or too low.

It is generally considered that the correct humidity to maintain in a school building is from 35 to 50 per cent. A good average is 40 per cent., with a room temperature of 68 degrees F. The new point of this is 42 degrees.

The method of humidifying the air to the proper proportion can be understood by a study of the arrangement of the air washer in relation to the heating and cooling surfaces used.

The first thing to decide upon after fixing our relative humidity standard is to find the corresponding dew point. The dew point is that when the air becomes saturated with moisture. For air at 70 degrees and a relative humidity of 35 degrees the dew point is about 37 degrees F.

per cent. the dew point is about 37 dethrough the washer the air will become saturated to the dew point, thus when the air is heated to 70 degrees F. at the secondary heating coils it will still contain approximately the same weight of water it picked up in the washer but its volume has become so much greater with its higher temperature that the air will seem to be no longer moist.

The best air washers are of the spray type and may be used as humidifiers. Paradoxical as it may seem, a form of spray type washer may be used for removing excess moisture from the air when using the apparatus as a cooling device. This special type of air washer is known as a dehumidifier. It is operated on two sets of sprays, the first using cold well water and the second refrigerated water.

Some cooling systems are installed on the principle of the mechanical refrigerator where a small brine pump is used in conjunction with a series of the regulation coils. Attempts have been made to cool air by placing blocks of ice in the fan room, but this has never been a success.

While it is not likely that our readers will be called upon to instal anything very elaborate in the way of an air cooling apparatus for a school building, it is well that they have a reasonable understanding of the function of such a plant, so that in the event of the matter being discussed by the board they will be in a position to supply some of the necessary information

Just as with heating systems, so with humidifying systems sensitive automatic control may be provided by means of "thermostats." In one type of installation two separate thermostats are used, one of these being placed in front of the air washer so as to control the temperature of the dew point and the other situated in the room where the temperature of the class room air is to be controlled.

There are also two other methods used in controlling humidity; one by the use of differential thermostat and the other by the use of the differential hygrostat. It is unnecessary to take up these two latter methods, as the first method mentioned is the simpler and the one most used in this country for school houses.

Many manufacturers of heating apparatus will endeavor to reduce the cost of installation of the other parts of the heating and ventilating system in the hope that thereby they may effect the sale of the specialty in which they are interested. Their favorite object of attack is the air washer. Their cry is "Cut it out, it is a useless expense." The truth is that if these same men were acting as independent engineers, with the interest of their client at heart, they would insist on the installation of the washer, if for nothing else than for its humidifying value.

Humidity in its relation to heating is worthy of the greatest amount of study. It is a self-evident truth that dry air, even when heated above the normal, will still be chilly. In breathing dry air the mucous membranes of the eyes and nose are affected so much that colds are easily contracted. The body becomes sensitive to drafts and the whole physical economy is thrown out of gear. The sallow faces of Canadians when compared with those of dwellers in countries where moist air is daily breathed should be proof enough that in our blind desire for higher temperate we have lost our sense of the health value of a lower temperature with higher humidities.

After the ventilating system is installed it is advisable for the engineer to call at the building when occasion affords, so that he can be assured that the plant he designed or installed is being properly operated. The writer, in his search for knowledge, has made it a practice to visit schools in any town where he has had an opportunity of spending a few extra hours, and has found, time and again, expensive ventilating systems unused, either because of the ignorance or laziness of the man placed in charge. I have seen the air washers covered with cobwebs, the ventilating fans standing idle, the wires disconnected from the motors, and to cap all, the boilers so full of soot that it was difficult to understand what the janitor was being paid for. It has been my pleasure at other times to find men in charge of these plants gifted with energy and intelligence in such degree that their services were of the very highest order. Men of this type are not hard to find and when a school board is prepared to pay for such service the lot of the ventilating engineer is happy indeed.

HAMILTON PICNIC

The members of the Hamilton Society of Domestic, Sanitary and Heating Engineers have completed arrangements for their annual picnic, which will be held at Wabasso Park on July 5. The Hamilton members have sent to the craft in Toronto a hearty invitation to attend in large numbers and have assured them that they will do their best to see that all are well taken care of and have a good time. Also they have issued to the Toronto men an official challenge to a game of baseball, and this, it is expected, will be accepted by the enthusiastic fans who have been making their way to the Don Flats each Wednesday afternoon. It promises to be a great game, but this is only one of the features of the big day the Hamiltonians are putting on, as there will be a big program of sports. The Toronto society will hold its picnic at Island Park on July 17, and it is likely that an effort will be made to have the Hamilton ball players play a return game in Toronto.

The Canadian Oil Co., Ltd., Toronto, is preparing plans for a $50,000 branch warehouse to be erected at London, Ont.

Market Conditions and Tendencies

Statements Regarding Supplies and Trend of Prices

THE MARKETS AT A GLANCE

WHILE the markets have been practically stationary in all lines of plumbing goods, there are many indications that this condition is only temporary and it is expected that higher quotations will become effective shortly on soil pipe and fittings, wrought pipe and some lines of brass and copper goods. As a result of labor troubles production has been considerably diminished and with a fairly active demand stocks of some goods are very low. It is practically impossible to obtain some lines of soil pipe.

The market for ingot metals is very firm and advances are noted in lead of ten cents per hundred and of half a cent a pound in spelter. Sheet copper has advanced one cent a pound. Prices of tin show no change and as supplies are coming in that are ample to meet demands, no immediate changes are expected. The market for aluminum has been somewhat quiet. Antimony has advanced a cent a pound.

From all parts of the country reports indicate a steady development in building and this will undoubtedly be greatly stimulated by the signing of peace. A great many large projects which have been held up because the owners did not consider it wise to proceed until it was certain that conditions were likely to be settled, will, it is stated, be gone ahead with. In Toronto alone it is stated that there was no less than $15,000,000 worth of building held up until it was known what the outcome of the peace proposals was to be. The settlement of the Winnipeg strike is welcome news in trade circles and a resumption of activities in the West is expected very shortly.

TORONTO, June 28.—Shortages of stock are becoming acute in some lines of soil pipe, brass goods and fittings, and the situation, owing to increasing demands due to building activity, is growing steadily worse. While prices so far have shown no change, there is little doubt that higher production costs will shortly result in pipe and fittings moving to higher levels. Ingot metals show a tendency to advance with the exception of tin, and spelter is up half a cent a pound, and lead shows an increase of ten cents per hundred. Sheet copper is a cent a pound higher. Prices of enamelware remain unchanged. A good, steady volume of business is reported.

Enamelware Prices Show Firm Tendency

Toronto.

ENAMELWARE.—Lines of enamelware are showing a tendency to develop very firmly as a result of steady improvement in demands and continued high costs of production. "Certainly there will be no reduction in prices," said one large manufacturer. "While stocks just now are ample to take care of demands, there has been a noticeable increase in the volume of business. I am not anticipating any increase in prices just now, but the market will be very firm, and if manufacturing costs continue to advance as they have been doing, higher prices are not at all unlikely." The signing of peace terms is expected in many quarters to have a noticeable effect in further stimulating building, and this will naturally increase the demands for these lines. Quotations on a few of the well known lines are as follows:

Bath-tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$32 10
Bath-tubs, 5½ ft.	35 70
Basins, flat back, 14 x 15 in.	6 45
Do., corner, 15 in.	7 15
Sinks, roll rim, 18 x 30 in.	15 05
Sinks, flat rim, 20 x 30	6 47 6 35
Do., 18 x 30	5 62 5 50
Do., 18 x 24	5 12 5 00
Do., 16 x 24	4 92 4 80
Do., 14 x 20	4 25 ....
Closets, oak tank and seat	25 50
Do., enamel iron or white vitro tank	27 50

No Changes Show in Price of Range Boilers

Toronto.

RANGE BOILERS.—The lower quotations which went into effect as a result of reductions made by United States firms remain unchanged. Business has shown some improvement although labor troubles in various parts of the country are showing their effects. A steady increase in the building activity is noted, however, and prospects are that range boilers will be in demand. Quotations are as follows:

Range Boilers	Standard	Extra Heavy
30-gallon	$11 00	$12 50
35-gallon	12 50	14 50
40-gallon	13 50	15 50
52-gallon	20 50	25 00
66-gallon	32 00	38 00
82-gallon	40 00	47 00
100-gallon	50 00	58 00
120-gallon	60 00	67 00

Higher Prices Likely For Soil Pipe, Fittings

Toronto.

SOIL PIPE, FITTINGS. — Stocks of these goods have become so depleted owing to the continuation of strikes that many firms are finding difficulties in filling orders. It will only be a matter of a very short time before they are completely out of several lines. There is every hope now that a settlement will be reached with the men who are out and that work will be resumed. There is little doubt, manufacturers say, that production costs will be greatly increased, and this means an advance in prics. In some quarters the opinion is expressed that this will be at least ten per cent. At the present time orders are coming in faster than most firms can get the goods, and there is every indication that a nice season's business will be handled. Quotations are as follows:

Medium and extra heavy soil pipe, 2, 3 5 and 6 in.	20%
Medium and extra heavy soil pipe, 4 in.	25%
Medium and extra heavy soil pipe, 2 in. to 6 in.	35%
8 in. extra heavy pipe and fittings	15%

PIPE FITTINGS

Cast iron fittings	20%
Plugs	35%
Bushings	35%
Unions, ¼" to 2½"	50%
Do., ⅛", 3" and larger	45%
Dart unions, ¼-inch to 2-inch	25%
Do., 2½-inch and larger	15%
Nipples, up to 4-inch	60%
Do., 4½-inch and larger	50%
Do., running thread 4-in. and under	30%
Couplings, 4-in. and under	40%
Do., 4½-in. and larger	20%

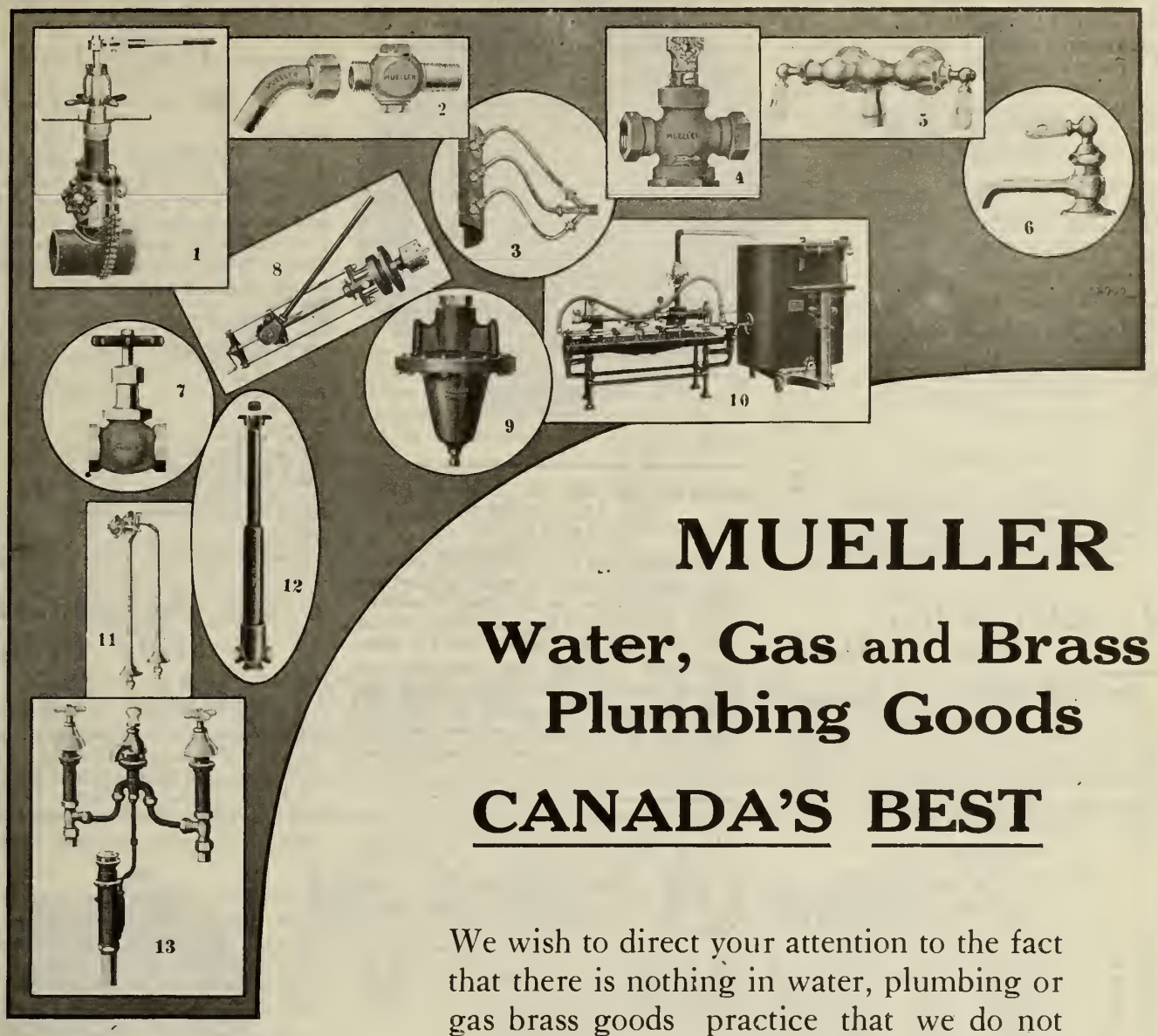
MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittings, Class A, lb.	$0 50	$0 60
Do., Class B, lb. net	0 22	0 30
Do., Class C, lb. net	0 14	0 21

Brass Steam Goods Remain Unchanged

Toronto.

VALVES.—Prices of all brass goods have remained stationary although the market is a firm one owing to increased



MUELLER

Water, Gas and Brass Plumbing Goods

CANADA'S BEST

We wish to direct your attention to the fact that there is nothing in water, plumbing or gas brass goods practice that we do not manufacture. The test of over 60 years of producing nothing but the very best in these lines conclusively proves that we are the masters of such manufacture.

We are illustrating a few of our various lines and wish to direct your attention to the fact that—

Our 1919 Catalog A is ready for distribution.

WE MAKE:

1—Tapping Machines
2—Corporation Cocks
3—Goose Neck Connections
4—Ground Key Curb Cocks
5—Rapidac Bath Cocks
6—Rapidac Basin Cocks
7—Globe Valves
8—Drilling Machines
9—Regulating Valves
10—Meter Testers
11—Bath Supplies
12—Service Boxes
13—Basin Combinations and many other articles of highest quality.

H. Mueller Mfg, Co., Limited

SARNIA, ONT. CANADA

demands and lowered production caused by labor troubles. Marine orders have been coming in steadily and there is an improvement noted in business in general. Firmer prices for copper and ingot metals have not yet affected brass goods but it is not unlikely that slight advances may be made in some lines before long. Quotations are:

Compression work, standard	50
High grade	49
Fuller work, standard	45
High grade	38
Basin cocks, No. 0 standard	40
Nos. 1 and 2	40
Bath cocks, compression	50
Bath cocks, Fuller	45
Flatway stop and waste cocks, standard.	50
High grade	47
Roundway stop and waste cocks, standard	50
High grade	47
Brass steam cocks, standard	Net List
Globe, angle and check valves, standard.	23%
Do., removable disc	22%
Radiator valves, standard	31%
Do., removable disc	Net List
Basin Cocks—	
No. 0 and 1, Fuller pattern	45
Compression	40
Quick opening	50
Globe, angle and check valves, standard, medium pressure	23%
Radiator valves ,standard med. pressure	31%
Radiator valves, removable seat, medium pressure	25

Wrought Pipe May Move Up Shortly

Toronto.

WROUGHT PIPE.—There is every indication that increased costs for manufacture will result shortly in wrought pipe moving to higher levels. Business shows some improvement, and this, it is expected, will be maintained. Quotations are as follows:

WROUGHT PIPE

Price List No. 39, April 3, 1919

Standard Buttweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
⅛ in.	$ 6 00	$ 8 00	$.....	$.....
¼ in.	4 53	6 66	5 13	7 26
⅜ in.	4 53	6 66	5 13	7 26
¾ in.	5 99	7 57	6 84	8 42
½ in.	7 53	9 66	8 68	10 81
1 in.	11 14	14 28	12 84	15 98
1¼ in.	15 07	19 32	17 37	21 62
1½ in.	18 01	23 10	20 76	25 85
2 in.	24 24	31 08	27 94	34 78
2½ in.	38 90	49 73	.....	.....
3 in.	50 87	65 03	.....	.....
3½ in.	64 86	81 88	.....	.....
4 in.	76 85	97 01	.....	.....

Standard Lapweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
2 in.	$ 27 94	$ 34 78	$ 31 64	$ 38 11
2½ in.	40 66	51 48	46 51	57 33
3 in.	53 17	67 32	60 82	74 97
3½ in.	66 70	83 72	75 90	92 92
4½ in.	88 00	113 00	107 00	132 00
4½ in.	89 00	113 00	107 00	132 00
5 in.	103 00	132 00	125 00	154 00
6 in.	133 00	171 00	162 00	200 00
7 in.	175 00	224 00	211 00	259 00
8L in.	184 00	235 00	221 00	273 00
8 in.	212 00	271 00	255 00	314 00
9 in.	254 00	324 00	305 00	376 00
10L in.	235 00	301 00	283 00	349 00
10 in.	303 00	387 00	365 00	449 00

Terms, 2% 30 days, approved credit.
Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Boiler Tube Prices Are Holding Steady

Toronto.

BOILER TUBES.—Business in tubes is inclined to be quiet and prices are showing no change. Labor troubles in various parts of the country are showing their effects on trade, and no very marked improvement in business is expected until conditions generally become more settled. Quotations are as follows:

BOILER TUBES—	Seamless	Lapweld
1¼ inch	$27 00	$.....
1½ inch	28 00	.....
1¾ inch	30 00	26 00
2 inch	30 00	26 00
2¼ inch	33 00	28 00
2½ inch	40 00	32 00
3 inch	46 00	38 00
3¼ inch	.....	45 00
3½ inch	56 00	42 00
4 inch	70 00	54 00

No Changes Shown in Waste or Oakum Prices

Toronto.

WASTE, OAKUM.—Only a fair volume of business in these lines is being handled at the present time as a result of labor troubles and so many factories being closed. The settlement of the troubles in Winnipeg is expected to result in increased business in that district, but trade in general is not likely to show any decided gains until conditions are more stabilized. Prices are as follows:

	Per 100 lbs.	
Best American	$21 00	$22 00
Clipper, spun	.....	21 00
Do., unspun	.....	10 50
Plumbers' spun	.....	9 50

HIGHER PRICES GO INTO EFFECT ON ALL LINES OF ENAMELWARE

As SANITARY ENGINEER goes to press, announcement is made of new and higher quotations on all lines of enamelware. Baths have been advanced 10 per cent. and the new prices on all other lines show a 5 per cent. increase over former figures. The new prices are made necessary, it is stated, by continued high cost of production, wages and general manufacturing costs having climbed steadily.

Sheets and Plates Are Holding Firmly

Toronto.

SHEETS, PLATES. — The markets have been stationary in sheets and plates and with only a fair volume of business offering. Some improvement is expected shortly, but there is nothing to indicate that there will be any revision of prices. Stocks that are ample to meet all demands are on hand and shipments are being made promptly.

Sheet copper has advanced a cent a pound, the prices being 26¼c for mill shipment and 29c per lb. for shipment from stock.

Firm Markets For All Lead Products

Toronto.

LEAD AND ZINC PRODUCTS.—Firm prices are ruling for all lead and zinc products, with a tendency toward slightly higher prices in many lines. No changes are shown yet in manufactured lead products or in solder, the quotations on the latter being as follows: guaranteed, 33c to 37c per lb.; strictly, 31c to 35c; commercial, 28c to 31c; wiping solder, 27½c to 30c; wire, 34c to 40c.

Firmer Markets For Scrap Copper, Lead

Toronto.

OLD MATERIALS.—A distinct improvement in business is noticeable in the markets for yellow metals and lead, and advances are expected at any time. The market for scrap rubber is decidedly weak. Prices at present are as follows:

Dealers' Buying Prices—		
Tea lead	....	0 03
Heavy lead pipe	....	0 04
Pipe scrap	....	8 00
Stove plate, per ton	....	10 00
No. 2 busheling	....	8 00
Yellow brass	....	0 07
Red brass	....	0 10
Light brass	....	0 05½
Scrap zinc	....	0 04½
Heavy copper	....	0 15
Wrought iron, No. 1, per gr. ton	....	15 00
No. 1 machinery cast	....	14 00
Heavy melting steel	....	9 00
Old rubbers, boots and shoes	0 06	0 06¼
Overshoes, lumbermen's rubbers boots	....	0 04½
Bicycle tires	....	0 04½
Automobile tires	0 03½	0 04

Copper, Antimony and Spelter Are Higher

Toronto.

INGOT METALS.—A firm market for all ingot metals is ruling with a splendid volume of business offering. Spelter has advanced half a cent, antimony a cent, and copper 2½ cents. Lead prices are also up ten cents per hundred. Prospects, it is stated, are for a strong market.

COPPER.—There has been a fairly brisk demand for copper and at higher prices, the quotations at present being in the vicinity of 21 cents. A strong buying movement continues in the American markets.

TIN.—Business in tin has been somewhat quiet, with stocks more than ample to take care of all the trade that is offering. Prices, however, have shown no change, and quotations are being made on the basis of 58 cents per lb.

SPELTER.—There has been considerable activity in spelter and a very firm market has developed with prices half a cent higher, the quotations being now 8c per lb.

LEAD.—An advance of 10c per hundred has been made in lead with a lot of business offering and prospects for a continued firm market. Quotations range from 6½c to 7½c.

Continued on page 30

American Plumbing Supplies and Jobbers

14 KING ST. WEST, MONTREAL

COHEN BROS., PROPS.

WE manufacture a full line of Steam, Vacuum and Combination Gauges, Locomotive and Duplex Gauges.

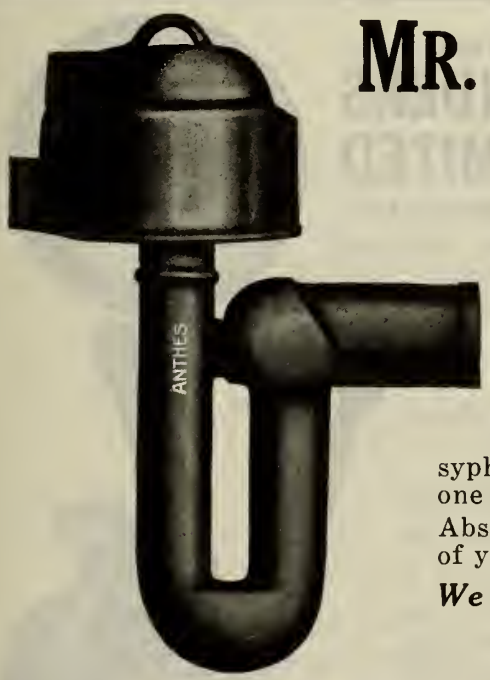
MORRISON'S Standard Test Gauges, Hydraulic, Altitude and Sprinkler Alarm Gauges, Combination Water Works Gauges.

PYROMETER Gauges, Engineers' Clocks and Revolution Counters, Pressure Gauge Testers, Pyrometers for Bakers' Ovens.

RECORDING Pressure and Temperature Gauges, Blast Pressure Gauges. Dealers in Thermometers for Heating Installations, Feed Water, Flue Gas, etc.

THE JAMES MORRISON BRASS MFG. CO., LIMITED

93-97 ADELAIDE STREET WEST, TORONTO, ONTARIO



MR. RURAL PLUMBER—

The farmer of to-day has capital and he means to have comfort. Thousands of farmers in all sections of the country are installing Sewage Disposal Systems and the demand at the present time is very keen.

You have only to let the farmer know that you are in a position to handle this work to secure many jobs.

In all this work it will pay you to use ANTHES syphons, soil pipe and fittings because of their durability. The ANTHES syphon is the only syphon which works on natural laws. It is cast entirely in one piece, having no moving parts to get out of order.

Absolute satisfaction and more business from the friends of your satisfied customers is the result.

We will furnish you with Sewage Disposal Blue Prints upon request

WE SHIP PROMPTLY ON RECEIPT OF ORDER.

Anthes Foundry Co., Limited

TORONTO and WINNIPEG

Pipe Fittings

Made in Canada

The Brand that has the Quality

M Brand Pipe Fittings, etc., give a service and satisfaction that will invariably get you re-orders and much new business as well.

A trial of the goods will prove this claim.

CAST IRON FITTINGS

With this brand mean fittings made with iron of high tensile strength—proper proportions and correct tappings.

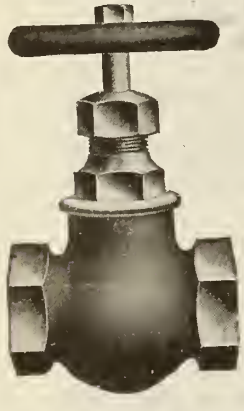
RECESSED DRAINAGE FITTINGS

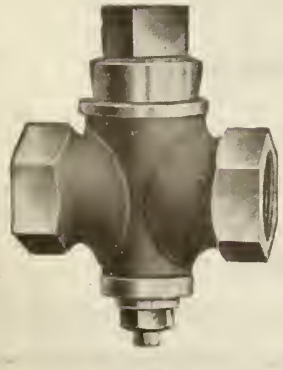
MALLEABLE FITTINGS

With this brand mean fittings made of Air Furnace Refined Iron, reamed and tapped to gauge with perfect threads

Standard and Extra Heavy Flanged Fittings and Flanges. Galvanizing Malleable and Gray Iron Castings of all Kinds.

International Malleable Iron Co., Limited, Guelph, Ontario, Canada





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UNITED BRASSFOUNDERS AND ENGINEERS, LIMITED

EMPRESS FOUNDRY, CORNBROOK, MANCHESTER, ENG.

DURING THE WAR our Plants have been exclusively engaged on work of supreme national importance.

WITH PEACE IN SIGHT we are pleased to announce that we intend to again direct our energies to the intensive production of:—

GUNMETAL and BRASS VALVES and COCKS.
STEAM, WATER and COMPRESSED AIR FITTINGS GENERALLY.
CAST IRON STOP and SLUICE VALVES.
SEMI-ROTARY PUMPS.
EXTRUDED BRASS and BRONZE BARS.
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"STELLA" BRAND ALLOYS: MANGANESE COPPER, SILICON COPPER, FERRO ZINC, PHOSPHOR COPPER and TIN, etc.

"UBEL" POST-WAR SERVICE

If you are interested in any or all of the lines mentioned, and are in a position to take a hand in the energetic distribution of the same, please communicate with us NOW to our Head Office, at above address.

Over 60,000 Daisy Hot Water Boilers Now in Use. Are *You* Selling Your Share?

Daisy Hot Water Boilers are easiest to sell because they have an established reputation for exactly meeting the requirements of the modern home.

Every Daisy you instal will help build bigger business by bringing repeat orders for installation in neighboring homes later.

WARDEN KING, Limited, Montreal

BRANCH OFFICE. 136 SIMCOE ST., TORONTO

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Hoyt Metal Co., Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

MALLEABLE IRON CASTINGS
Gurney Foundry Co., Limited, Toronto.

MIXING VALVES
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Port Hope Sanitary Mfg. Co., Ltd., Port Hope.

MONKEY WRENCHES
G. & W. G. Gummer, Ltd., Rotherham, Eng.
Trimont Mfg. Co., Roxbury, Mass.

OVERALLS
R. G. Long & Co., Toronto.

PACKING
Canadian Wolverine Co., Ltd., Chatham.
Canadian H. W. Johns-Manville Co., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.

PACKLESS RADIATOR VALVES
Kerr Engine Co., Walkerville.

PIPE AND RADIATOR HANGERS
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Beaton & Corbin Mfg. Co., Southington, Conn.

PIPE, BLACK AND GALVANIZED
Canadian Tube & Iron Co., Ltd., Montreal.
Consumers Metal Co., Ltd.
Empire Mfg. Co., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.

PIPE CLEANSER
Borden Canadian Co., Ltd., Toronto.
Canadian Wolverine Co., Ltd., Chatham.
Chamberlain Desolvo Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Trimont Mfg. Co., Roxbury, Mass.

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Canadian Wolverine Co., Ltd., Chatham.

Canadian H. W. Johns-Manville Co., Toronto.
James Morrison Brass Mfg. Co., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.

PIPE, SOIL, AND FITTINGS

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Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Toronto Hardware Mfg. Co., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.
Warden King, Ltd., Montreal.

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Borden Canadian Co., Toronto.
John Hall & Sons, Ltd., Brantford.
A. B. Jardine & Co., Hespeler.
Wells Bros., of Canada, Galt.

PIPE WRENCHES

Borden Canadian Co., Toronto.
Trimont Mfg. Co., Roxbury, Mass.
J. H. Williams Co., Brooklyn, New York.

PNEUMATIC WATER SUPPLY TANKS

Empire Mfg. Co., London and Toronto.
Wm. B. Scaife & Sons Co., Oakmont, Pa.

PORCELAIN WARE

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Empire Mfg. Co., Ltd., London and Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
R. MacDougall & Co., Ltd., Galt.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

RADIATOR FOOT RESTS

Beaton & Cadwell Mfg. Co., New Britain, Conn.

RADIATORS

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Lord & Burnham Co., Ltd., Toronto.
Steel & Radiation, Ltd., Toronto.
Warden King Ltd., Montreal.

RADIATOR TRAPS (STEAM)

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C. A. Dunham Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

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Toronto Hardware Mfg. Co., Toronto.

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James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

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Canada Metal Co., Ltd., Toronto.
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H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

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R. G. Long & Co., Toronto.

SOLDER

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Kerr Engine Co., Walkerville, Ont.
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Trimont Mfg. Co., Roxbury, Mass.
Williams, J. H., & Co., Brooklyn, N.Y.

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Empire Mfg. Co., London and Toronto.

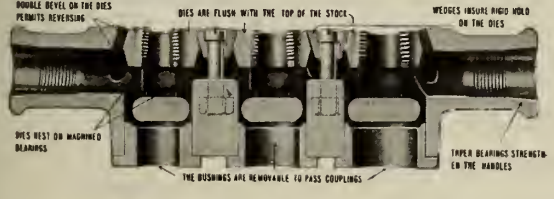
WASHING MACHINES

Gurney Foundry Co., Limited, Toronto.

For Easy Pipe Threading
TRY THE TRIO

Simple — Compact — Complete
3 Dies in 1 Stock

The TRIO uses Little Giant Pipe Dies with the patented double bevel which permits reversing---carries the three sizes you use most frequently. TRIO is fully adjustable.

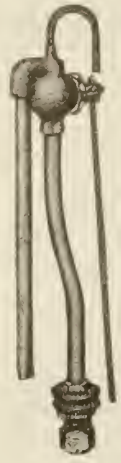

DOUBLE BEVEL ON THE DIES PERMITS REVERSING
DIES ARE FLUSH WITH THE TOP OF THE STOCK
WEDGES INSURE RIGID HOLD ON THE DIES
DIES REST ON MACHINED BEARINGS
TAPER BEARINGS STRENGTHEN THE HANDLES
THE BUSHINGS ARE REMOVABLE TO PASS COUPLINGS

Always Ready---Always Right
Ask for Catalogue

Wells Bros. Company
of Canada, Ltd., Galt, Ontario

Canadian factory of the Greenfield Tap and Die Corporation

Quaturn Ball Cocks



Did you ever sell a **whistling, noisy Ball Cock?** It didn't advertise you very well, did it? And very likely your customer was not much pleased either.

Next time use Quaturn.

Because, under moderate pressure they operate quickly, positively and noiselessly.

Because the working parts may be renewed when worn, without taking off the body, and they are interchangeable with all other Quaturn fixtures.

Because they close with the pressure and therefore tend always to close tighter, eliminating leaks.

Because a satisfied customer means more business for you.

The WALLACEBURG BRASS & IRON MANUFACTURING COMPANY, Limited

WALLACEBURG, ONT.

Toronto	Winnipeg	Montreal
10 Wellington St. E. Phone: Main 2355	Galt Building. Phone: Garry 3389	358 Beaver Hall Sq. Phone Main 7531
Mr. L. N. Vanstone	Moncrieff & Endress, Ltd.	J. R. Devereux & Co.

No Waste Circulation

THE SANITARY ENGINEER, PLUMBER AND STEAMFITTER OF CANADA was established in 1907. The subscribers represent the most progressive members of the sanitary plumbing and heating trade in Canada. The paper is issued twice monthly, on the first and fifteenth of the month. Circulates in all Provinces of Canada as well as Newfoundland. There is no waste circulation on SANITARY ENGINEER, because subscribers buy the paper for business. The advertising pages are read closely by the largest buyers of sanitary and heating goods in Canada. These men buy for business as well as for private consumption and, therefore, represent the best class of readers. When you advertise in the SANITARY ENGINEER you are assured of an attentive audience, who are looking for information about your goods and your methods of doing business. Cost of advertising is very moderate, indeed, and we will gladly supply detailed information regarding rates and circulation.

THE

TRADE K–T IE MARK

FOUNDRY

GALT - ONT.

Do Your Castings Cost Too Much?

A rearrangement of your patterns might cut their cost 25%; a different method of molding them might double your production at no increase in molding cost. **We can advise you** and we have expert metal and wood pattern-makers who are able to make any changes that may commend themselves to you.

If you need some new Patterns

send us a sample, blueprint or sketch, and ask for our advice. It won't cost you anything. If our advice is good and commends itself to you, it is only fair to assume that our work will be equally satisfactory, and we need the work as badly as you need the patterns.

We are in a position to do turning, boring, drilling or other semi-finishing operations on castings supplied by us.

ASK US

"Wolverine"

BRASS NUTS AND SCREWS

with

Machine Cut Threads

(Hot Rolled)

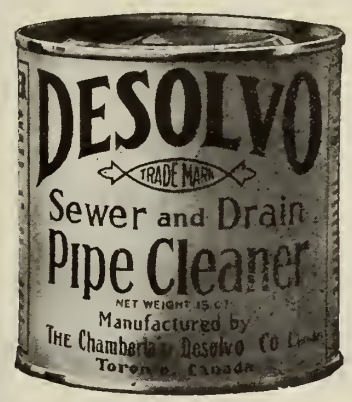
Assortments

furnished in partitioned metal boxes with tweezers for easy handling

This is Assortment No. 3078

Canadian Wolverine Co., Ltd.

Chatham, Ontario



A Few Facts About DESOLVO

You have one of the best helpers you can secure when you have Desolvo ready to hand.

Desolvo is the only pipe cleaning compound which mixes readily with cold water.

Desolvo will do work quicker and with less effort and expense than any other method.

Desolvo is on sale everywhere and is very easy to carry around.

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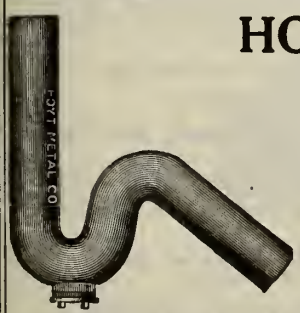
Eastern Representatives:

Richardson & Bureau, 55 St. Francis-Xavier St. Montreal, Que.

General Office: Pittsburgh.

HOYT METAL GOODS ARE KNOWN

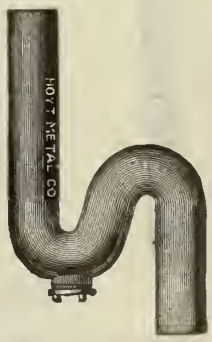
FROM COAST TO COAST



As time-savers there are none equal to our Wiping Solder, Bar or Wire Solder.

Hoyt Lead Traps, bends and waste pipe are in a class by themselves.

All our products are made to formula.



Our Mixed Metal Sales Amount To Over $5,000,000 Annually.

Write your Jobber

HOYT METAL COMPANY, TORONTO, ONTARIO

New York, N. Y., London, Eng., St. Louis, Mo.

Write Us

The Complete Imperial Water Heater

BY installing "IMPERIAL" heaters, you serve your customers' interests, as well as your own.

"IMPERIAL" heaters, are made in three sizes, for the ordinary, heavier, or heaviest requirements.

PERFECT HEAT baffling. Absolute water CIRCULATION.

Sectional View Showing Water Flow

POWERFUL. ECONOMICAL.

For either ARTIFICIAL or NATURAL Gas.

IMPERIAL CITY HEATERS, LIMITED

SARNIA, CAN.

The Wrench of 25% Greater Efficiency

TRIMO PIPE WRENCH

Two new features have been recently added to the Trimo Pipe Wrench, namely Nut-Guards, in all sizes, and unbreakable steel frames, in leading sizes.

The Nut-Guards prevent the accidental rotation of the nut while in use.

These improvements add 25% to the usefulness of the tool.

The Trimo Pipe Wrench is made with wood handles in 4 sizes, 6-in., 8-in., 10-in., 14-in. and in steel handles in all sizes, 6-in. to 48-in. inclusive.

All Trimo Pipe Wrench parts are interchangeable.

The inserted jaw in the handle can be readily replaced when worn, thus adding to the life of the tool.

Nut with Nut-Guards

Inquiries from Importers and Dealers Solicited. Send for Catalogue No. 55.

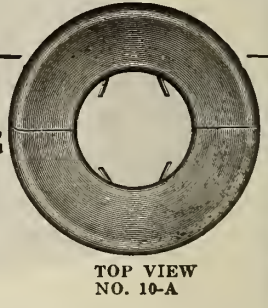
TRIMONT MANUFACTURING CO.

Cable Address: Triwrench
Code: Western Union

Roxbury (Boston) Mass., U.S.A.

OPEN VIEW NO. 10-A

The CEILING PLATE that's better



TOP VIEW NO. 10-A

THE NO. 10—A NARROW FLANGE PLATE—IS A STEEL HINGED PLATE. FLANGES ¾" WIDE. HIGHLY FINISHED. ESPECIALLY DESIGNED FOR TWIN CONNECTION "NARROW."

Gem No. 4.

The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

High quality at the right price.

Gem No. 4 Automatic Air Valve

Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

Write for catalog showing our complete line of specialties.

The BEATON & CADWELL MANUFACTURING Co.

New Britain, Conn.

Eastern Agent: J. R. Devereux & Co., 358 Beaver Hall Square, Montreal. Western Agent: A. E. Hinds & Co., Chamber of Commerce, Winnipeg.

ADVERTISING INDEX

Allison, K. B. ..... Back Cover
American Plumbing Supplies 36
Amherst Foundry Co. .... Inside Front Cover
Anthes Foundry Co. 37
Armstrong Mfg. Co. 48

Beaton & Cadwell 44
Beaton & Corbin 48
Borden Canadian Co. 48
Bottum Valve Co. 46

Canada Metal Co. 7
Canadian Tube & Iron Co. 47
Canadian Wolverine Co. 43
Chamberlain Desolvo Co. 43
Consumers Gas. Co. 5

Dunham, C. A., Co., Ltd. 3

Empire Manufacturing Co. ..... Outside Front Cover

Fittings Limited 9

Gummer, G. W. G., Ltd. 2
Gurney Foundry Co., Ltd. 47

Hall, J. H. 49
Hause Mfg. Co., Chas. F. 48
Hoyt Metal Co. 43

Imperial City Heaters, Ltd. 44
International Malleable Iron Co. 38

Jardine, A. B., & Co. 4
Jenkins Bros., Ltd. 45

Katie Foundry, The 43
Kerr Eng. Co., Ltd. ..... Inside Back Cover

Long, R. G., & Co. 46
Lord & Burnham 11

McDougall & Co., R. 47
McIntyre & Taylor, Ltd. 48
Modern Heating & Engineering 3
Moline Heat 5
Morrison Brass Mfg. Co., Ltd., Jas. 37
Mueller Mfg. Co. 35

Port Hope Sanitary Mfg. Co. 12

Scaife & Sons Co., Wm. B. 46
Standard Sanitary Mfg. Co. 8
Steel & Radiation, Limited 4

Taylor Forbes 9
Trimont Manufacturing Co. 44
Toronto Hardware Mfg. Co. 46

United Brassfounders & Engineers, Ltd. .. 38

Wallaceburg Brass & Iron Co. 42
Warden-King, Limited 39
Wells Bros. of Canada 41
Williams, J. H., & Co. ..... Inside Back Cover

Why Jenkins Bros'. Valves Are Superior

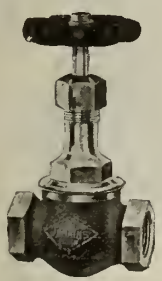


Fig. 106

They are the original renewable Disc Valves. They have more imitators than all other makes of valves combined. They have kept pace with increasing steam pressures and severe working conditions. They are of the simplest design, and can be easily repaired by any man of ordinary intelligence. They are made interchangeable in every part, and any part can be duplicated promptly and inexpensively by the dealer. In the majority of cases they can be repaired by merely changing the disc without the laborious task of regrinding.

Fig. 108

They are recognized as the Standard Steam Valves in all parts of the World, and wherever there are supply houses—Jenkins Bros'. Valves will be found. The Standard of quality never changes except to improve, and while to-day there are hundreds of imitators, the sales of genuine Jenkins Bros'. Valves are constantly increasing.

Fig. 114

Catalogue No. 8 sent free on request.

Fig. 124

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JENKINS BROS.
LIMITED
Agencies in all the Principal Countries of the World

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Steel Tanks for Every Purpose

A FEW "SCAIFE" SPECIALTIES:

Air Receivers
Boilers—Hot Water
Expansion Tanks
Filters (water)
Hot Water Tanks
Hydro-Pneumatic Tanks
Range Boilers
Tanks (steel)
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117 years old Founded 1802

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Home Office: Pittsburgh, Pa.
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The Heart of the BV Vapour System

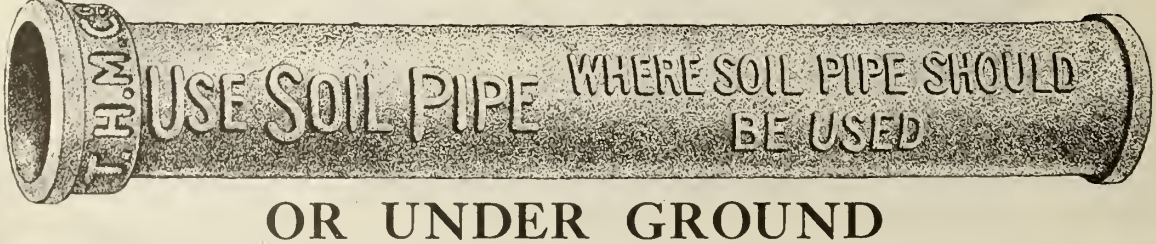
The BV Vapour Regulator will lift 25 lbs. on one ounce of pressure.

Territory for Sales Representatives

The BV Air Eliminator

Bottum Valve Company
213 W. Schiller Street,
CHICAGO, ILL.

IN THE BUILDING



OR UNDER GROUND

ASK YOUR JOBBER FOR T.H.M. CO. BRAND OF SOIL PIPE AND FITTINGS.

TORONTO HARDWARE MFG. COMPANY, - Toronto, Canada

WE MANUFACTURE A FULL LINE OF HIGH-GRADE RANGE BOILERS

WROUGHT PIPE

BLACK and GALVANIZED
SIZES, 1/8 IN. TO 4 IN.

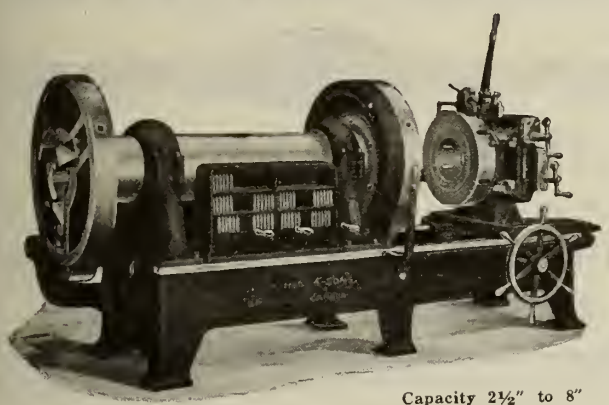
All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

All Sizes of NIPPLES (Black and Galvanized)

Ask your jobber for CT *Brand of Wrought Pipe*

CANADIAN TUBE & IRON CO., LIMITED, MONTREAL
Works: Lachine, Can.

Pipe Machines of Merit



Capacity 2½" to 8"

THE HALL No. 8

Duplex Improved Gear Box Driven. Capacity 2½ in. to 8 in. inclusive

Note the drive belt at rear out of operator's way. Elevated die cabinet, control lever and speed levers all convenient to operator's right hand. Sliding die head.

These machines are equipped with a friction clutch, enabling operator to revolve pipe a few inches, if necessary.

Pipe Machines ranging from ⅛ to 18".
Nipple Machines ranging from ⅛ to 4".
Roller Pipe Cutters ranging from ⅛ to 4".

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Write us for full particulars and prices.

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LIMITED
GALT, ONT., CANADA

REG. VALVENE

"VALVENE" Discs
(REGISTERED)

Specially prepared for Hot and Cold Water Taps. All sizes from ½ inch to 1½ inches. Soft, Pliable, and "Joint-Perfect."

Price List and Samples on Application.

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SOLE MANUFACTURERS
585 Commercial Road, LONDON, E.1.

REG. VALVENE

GURNEY-OXFORD BOILERS RADIATORS

FOR HEATING ANY DESCRIPTION OF BUILDING BY STEAM OR HOT WATER

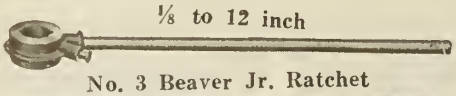
THE GURNEY FOUNDRY CO. LIMITED

TORONTO MONTREAL CALGARY WINNIPEG VANCOUVER

BEAVER TOOLS

For Easy Cutting

⅛ to 12 inch



No. 3 Beaver Jr. Ratchet

THE pipe-threading problem is readily solved when **Beaver Easy-Working Die Stocks** are used. They cut quicker and save labor, time and money.

They eliminate troublesome bushings and the bother of changing dies.

Beaver Threaders are easily adjusted. Simply "move the handle—that's all."

Beaver Tools are absolutely guaranteed. The user and the dealer are both protected.

Write us for descriptive circular and prices.

The Borden Canadian Company

110 Church St. - - - Toronto, Canada

"BC" COMBINATION COLD ROLLED STEEL Floor and Ceiling PLATES

Carried by the leading supply houses

No. 15

Puts just the right finish on that heating job

Send for catalog of complete line of "B. & C." goods.

No. 1 Valve

Stock carried by our Canadian Representative W. H. CUNNINGHAM & CO. 183 Church Street Toronto, Ont.

No. 16

No. 17

The Beaton & Corbin Mfg., Co.
Southington, Conn., U.S.A.
The Old Original Company

GENUINE

ARMSTRONG STOCKS and DIES

Hinged Pipe Vises *Pipe Cutters*

Pipe Threading Machines

—MANUFACTURED BY—

THE ARMSTRONG MFG. Company

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248 Canal Street NEW YORK

"HAUSE" PIPE JOINT CEMENT

For steam, water, air, oil, gas, gaskets, etc. The cement that cements. Sets like gum. Allows no leaks.

The Great Value of "HAUSE PIPE JOINT CEMENT" lies in its peculiar chemical properties which permits of its hardening and expanding after the joints are made up. In making up joints it has the same effect as a lubricant on the best graphite, and while the joints may be made and broken readily, a perfectly tight joint is maintained at all times. Comes in 1-lb., 5-lb., 15-lb., 25-lb., 50-lb. cans, 100-lb. barrels. Manufactured in ready mixed and powder form. Ask your jobber for prices, or write us direct.

Made in Omaha, Neb., U.S.A.

Manufactured in Ready Mixed and Powder Form.

Canadian Distributors:

Empire Manufacturing Co., Limited

LONDON and TORONTO

WORTH WHILE PUBLICITY

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M. & T. Coils

mean that perfect circulation is procured, that liberal waterways eliminate the possibility of chokage, all of which means durability and lots of hot water.

M. & T. Coils

are made of the best grey iron, free from sand or blowholes. Every coil is properly tapped with perfect standard threads and fully guaranteed.

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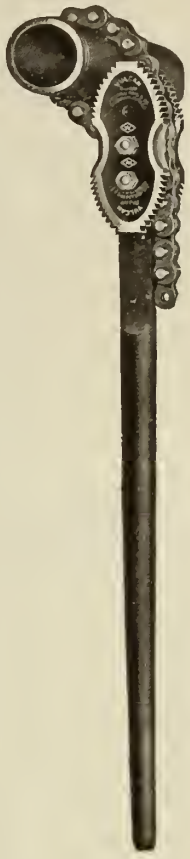

There's proved and certified strength in every

WILLIAMS' IMPROVED "VULCAN" CHAIN PIPE WRENCH

Each and every Flat Link chain is "proof-tested" to two-thirds of its listed catalog strength in a standard tension machine. To each chain so tested is attached the Gray Leaden Seal, illustrated above, and every Flat Link Chain leaving our works *must* bear this seal—the Proof of Quality—as evidence that it has passed our standardized "proof-tests."

Look for this Mark of Proof for it is Proof of Quality—it guarantees uninterrupted, severe service as well as safety to the operator. Williams' "Vulcan" Chain Pipe Wrenches are the *only* wrenches which offer this certified assurance.

Descriptive Booklet on request

J. H. Williams & Co.

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Agents for Manitoba, Saskatchewan, Alberta and British Columbia

General Offices :
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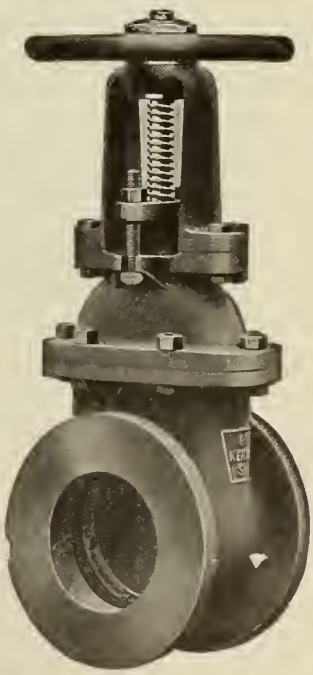
Advertised and Sold

but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.
Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.
Approved by the Fire Underwriters' Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

Introducing The "ALLPRISER"

Know Your Costs

EVERY common-sense business man must realize the absolute necessity of having easily understandable, up-to-the-minute cost figures to successfully operate a business. The higher the market price of commodities becomes, the more essential it is that he must *Know, Not Guess,* at costs. But the average business man in our line has heretofore felt unable to afford such apparent luxuries and has continued the old expensive practice of *guessing at costs* every time he sells, with the result that losses have been a part of his daily life.

Eliminate Loss

Do away with this guess work, and instead take on "ALLPRISER" Cost Service. Do not sell a fitting for 10c when it costs 12c; it may take 15c worth of time to actually figure up its value. Sail four square with the wind, lay your cards on the table, and see that you get all, but no more, than your just recompense—and you will get it, never fear.

Reduce Overhead

If you really desire to reduce your overhead expenses, a simple set of bookkeeping books properly kept, plus an absolutely essential cost system will just do that little thing for you and permit you to establish a legitimate profit, and at the same time help to keep down the cost of living. I do not believe any one in our craft wants to be anything but honest, and it is just plain "ignorance" that creates the appearance of some apparent wrongdoing.

A Direct Appeal

Need I appeal any further than to say that I will render this service at $25.00 a year? In so basing this ridiculously low charge I am banking on the hearty response of each and every member engaged in our worthy and most necessary calling to create a volume sufficient to justify "only $25.00."

The issue in loose leaf form will be off the presses July 1st (or very close to it).

I have started something for More Efficiency. Don't show you have fallen down, but instead write *Right Now* for subscription blank. References:—*The Trade.*

What Is "Allpriser?"

It is a flexible leather-bound book 7 x 9 containing 150 pages (loose leaf). It is a Trade Cost book specially gotten up for plumbing and heating.

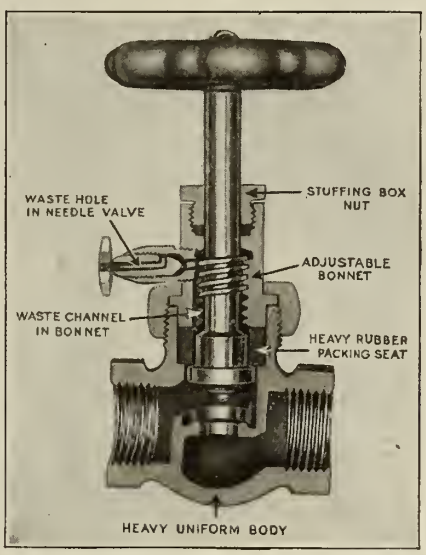
It includes a list with net prices of all staple every day articles at a glance. "ALLPRISER" includes a regular service of price sheets compiled and revised every time a change takes place.

KENNETH B. ALLISON

668 Yonge Street - - TORONTO

Sanitary Engineer
Plumber and Steamfitter of Canada
VOL XIII. PUBLICATION OFFICE, TORONTO, JULY 15, 1919 No. 14.

"EMCO" STOP AND WASTE COCK



Cross Section "Emco" A332 Stop and Waste Cock.

THIS is a new line which can be used either as a straight Stop Cock or a Stop and Waste Cock. The adjustable bonnet allows the needle waste valve to be placed in proper position for catching waste water, and when turning on and off water, the needle valve may be shut off independently, preventing that rush of water out of the waste tube.

All "Emco" lines are thoroughly tested before leaving our factory.

Look for the "Emco" trade-mark

EMPIRE MANUFACTURING CO., LIMITED
LONDON AND TORONTO, CANADA

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While

A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

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"Standard"
"Perfection" Built-in Baths

Made in One Piece Enamelled All Over

These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in-Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners meaning bathroom sanitation.

Made in 5 and 5½ foot sizes.

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Montreal:
358 Beaver Hall Square

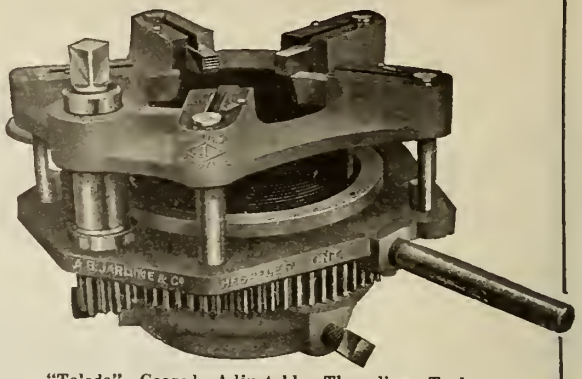
Calgary:
325 Eighth Avenue West

Vancouver:
847 Beatty Street

"MADE IN CANADA"

SANITARY ENGINEER, July 15th, 1919. Published the 1st and 15th of each month at 143-153 University Ave., Toronto, Canada, by The MacLean Publishing Co., Ltd., Vol. XIII., No. 14. Yearly subscription rates: Canada, $1.00; United States, $1.50; Great Britain and the Colonies, 4s. 6d.; elsewhere, $2.00. Entered as second-class at the Post Office Department, Ottawa. Entered as second-class matter July 1st, 1912, at the Post Office at Buffalo under the Act of March, 1897.

JARDINE and TOLEDO PIPE THREADING TOOLS



"Toledo" Geared Adjustable Threading Tool No. 2½. Capacity 2½ to 6 in. inclusive. Weight, 120 lbs.

THE ratchet feature of Jardine and Toledo Tools permits their being used to thread pipe which is already in place, no matter how awkward it may be to reach. The Jardine and Toledo have no cams or jim cracks to get out of order; and the dies only cut with the mouth of the cutter. Also, as the tool advances on the thread the dies open out so as to make the proper taper. This means there is no friction on the pipe and every ounce of strength is used in making the cut, so saving time and labor. These are only a few of the valuable features of these tools.

SEND FOR CATALOGUE

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Sole makers of "Jardine" Pipe-Threading Tools.
Sole licensees to manufacture and sell Toledo Pipe-Threading Tools in Canada.
Agents, Winnipeg and West—Stanley Brock, Ltd., Winnipeg, Man.
Brockville and East—J. R. Devereux, 358 Beaver Hall Square, Montreal.
Belleville and West—W. H. Cunningham & Co., 183 Church St., Toronto, Ont.

You Sell in the Dark

when you're guessing at costs. To know your costs, eliminate loss, reduce overhead expense and know where you stand—you should be enjoying "Allpriser." Why sell a fitting for 10c that costs 12c? Be up with the times; know your cost the "Allpriser" way.

Without "Allpriser"

you're struggling in a maze of "almost," "somewhere-near," "just-about" and general guesswork. Can any man compete in modern business that runs on dead reckoning? Exact navigation is needed to avoid the rocks and shoals of business to-day.

"Allpriser" is a flexible leather-bound book. 7 x 9 of 150 pages (loose leaf). It's a trade cost book especially for plumbing and heating. It includes a list with net prices of all staples. It provides a service for $25 a year that keeps price sheats revised to the latest change.

Write for subscription blank or further information.

Kenneth B. Allison

668 Yonge Street Toronto, Ont.

The Financial Post

This is a business man's paper. It is of interest to every man who has money invested either in his own business or in bonds and securities of various kinds. It is published weekly, and the news is given in very readable form.

Wholesale and retail merchants find it valuable because they are interested in market tendencies and market factors, not only as applied to their business, but also as applying to business in general. They need to know conditions local and remote. They need information to enable them to buy right and sell safely.

And the knowledge they need they can have for the insignificant sum of $3 annually.

THE FINANCIAL POST OF CANADA,
143-153 University Ave., Toronto.

Please enter me as a regular subscriber, commencing at once. If I am satisfied with the paper, I will remit $3 to pay for my subscription on receipt of bill.

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S. E.

OFFICIAL BULLETIN

OF

The Canadian Society of Domestic Sanitary and Heating Engineers

To the Sanitary and Heating Craft throughout the Dominion of Canada, Greetings—

As President-elect of the above Society, I extend to all those engaged in our calling, a hearty invitation to join us in our effort to organize those in our business throughout Canada.

Our Society stands for a fair deal to everyone and only by everyone doing their utmost to further the organization of our craft, will we attain those conditions which are the desire of all.

You will be doing your bit if you have, first of all, read the report of our recent Convention, as published in June 15th issue of the SANITARY ENGINEER, if you have not read same, do so at once. Secondly, notify our secretary that you desire to help and give particulars of our trade conditions in your city or town, stating if you belong to a local or provincial association, or if there is one in your locality.

Watch this page in each issue, and remember our motto—

ALL FOR ONE
AND
ONE FOR ALL

Yours for co-operation,

FRANK R. MAXWELL, President.

Address all Communications to

Garrett F. Frankland,
Secretary.
Room 303, 22 College Street,
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Over 60,000 Daisy Hot Water Boilers Now in Use. Are *You* Selling Your Share?

Daisy Hot Water Boilers are easiest to sell because they have an established reputation for exactly meeting the requirements of the modern home.

Every Daisy you instal will help build bigger business by bringing repeat orders for installation in neighboring homes later.

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Did you ever sell a **whistling, noisy Ball Cock?** It didn't advertise you very well, did it? And very likely your customer was not much pleased either.

Next time use Quaturn.

Because, under moderate pressure they operate quickly, positively and noiselessly.

Because the working parts may be renewed when worn, without taking off the body, and they are interchangeable with all other Quaturn fixtures.

Because they close with the pressure and therefore tend always to close tighter, eliminating leaks.

Because a satisfied customer means more business for you.

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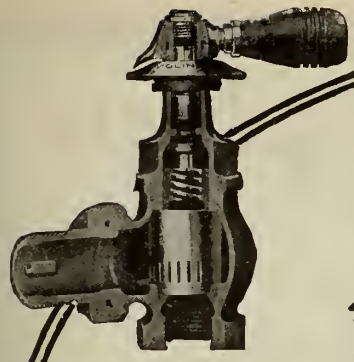
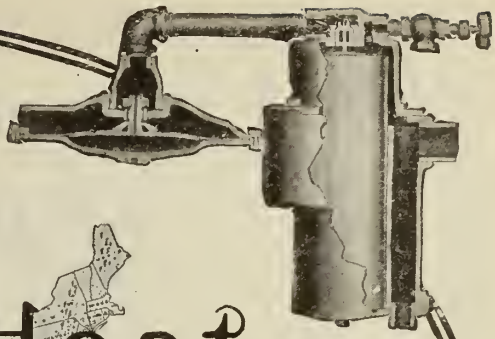
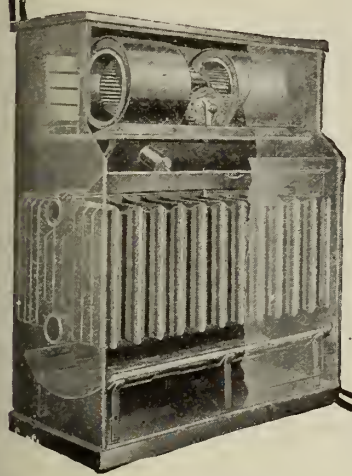


A GOOD LINE
of Equipment for
YOU to sell—



Moline Heat

EVERYWHERE



Moline Heat — System of Steam Circulation and Control

UNIVENT — Last Word in Combined Heating and Ventilating

"LIVE OUTDOORS—INDOORS"

Liberty Draft Controller — and other products

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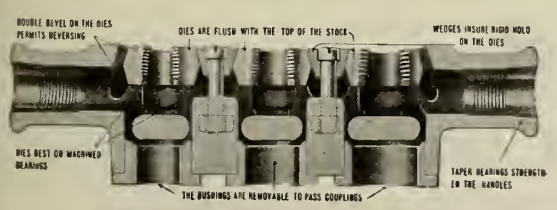
Moline, Ill.

For Easy Pipe Threading
TRY THE TRIO

Simple — Compact — Complete

3 Dies in 1 Stock

The TRIO uses Little Giant Pipe Dies with the patented double bevel which permits reversing---carries the three sizes you use most frequently. TRIO is fully adjustable.


DOUBLE BEVEL ON THE DIES PERMITS REVERSING
DIES ARE FLUSH WITH THE TOP OF THE STOCK
WEDGES INSURE RIGID HOLD ON THE DIES
DIES REST ON MACHINED BEARINGS
TAPER BEARINGS STRENGTHEN THE HANDLES
THE BUSHINGS ARE REMOVABLE TO PASS COUPLINGS

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Canadian factory of the Greenfield Tap and Die Corporation

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"Business men do not realize the value which trade journals and technical magazines may have for them in increasing the efficiency of their factories and in giving them a broad and comprehensive view of their business.

"Our foreign competitors read almost every article published upon their business with great care and thoroughness. Many of them have duplicate copies of their favorite trade paper sent to their homes so that they may read them away from the business without being disturbed. Many foreign manufacturers contribute articles to these journals on phases of the business with which they are most familiar. Such articles are bound to be helpful and have a constructive effect.

"Our trade journals and technical papers are the best in the world, and they should be supported and encouraged by our business men.

"Copies should be placed where employees can see them and they should be urged to read and study them.

"These papers are preaching the gospel of sound business on practical lines and are helpful not only to business but to the country as a whole.

"If the suggestions made by them in the past had been followed by our business men it would not be necessary at this time to point out some of the fundamental weaknesses in American business."

—Edward N. Hurley, formerly Chairman of the Federal Trade Commission, in "The Awakening of Business."

The following is list of the MacLean publications. Every publication is a leader in its field. Write us for any information you may desire with regard to the field covered, advertising rates, etc.

TRADE NEWSPAPERS

Hardware and Metal	Canadian Grocer	Dry Goods Review
Men's Wear Review	Bookseller and Stationer	Sanitary Engineer

TECHNICAL PAPERS

Canadian Machinery	Canadian Foundryman	Marine Engineering
Power House	Printer and Publisher	Can. Motor, Tractor and Implement Trade Journal

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The MacLean Publishing Company, Limited

153 University Avenue, Toronto **Southam Bldg., 128 Bleury Street, Montreal**
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Burnham Boilers

Reduces Profanity

WITHOUT any claims for eligibility to the Bible Class, we are doing our part to reduce profanity in relation to boilers.

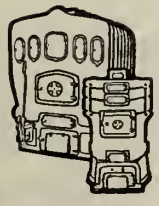
For example, the exclamation points caused by the scoop hitting on the fire door frame, because the door opening is so small you almost have to use a shoe horn to get the scoop in.

Like the Burnham fire travel, Burnham boiler fire box doors are generous in size.

One reduces coal bills.

The other reduces profanity.

Both induce friendship for Burnhams.



Lord & Burnham Co. Limited of Canada

(Boiler Department)

ROYAL BANK BUILDING, TORONTO

Factory: St. Catharines, Ontario

G. & W. G. GUMMER, LIMITED

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And at
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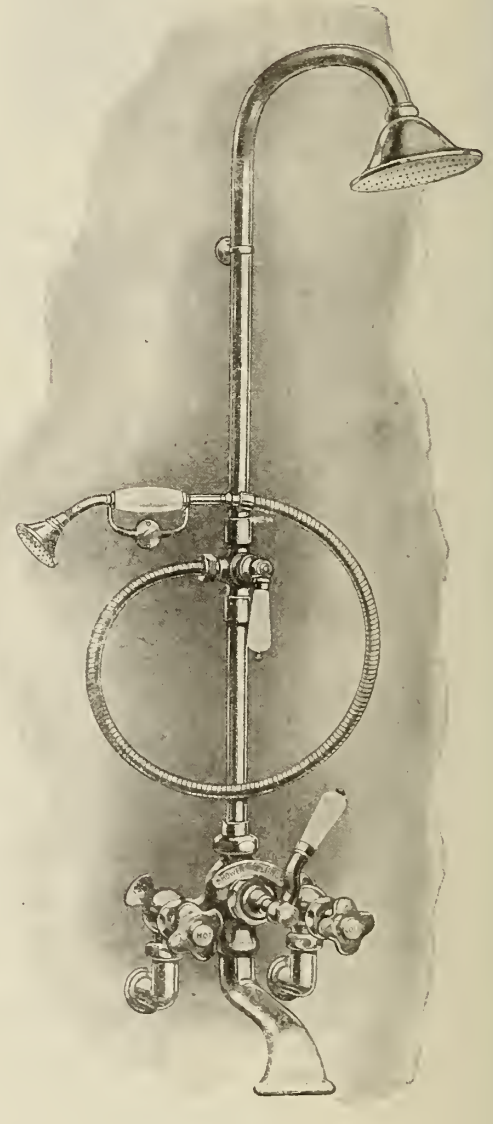
ENGLAND



"Dual" Mixer

A valve that really mixes Hot and Cold Water, and maintains a uniform mixture.

For ease of operation, simple construction and easy installation, it has set a new standard of efficiency.

Cold Water must be turned on first, no possibility of scalding.

Made in several forms for Showers, Sprays, Operating Rooms, etc.

At the well-known works of Messrs. Brunner, Mond & Co. these valves provide baths for 2,500 employees.

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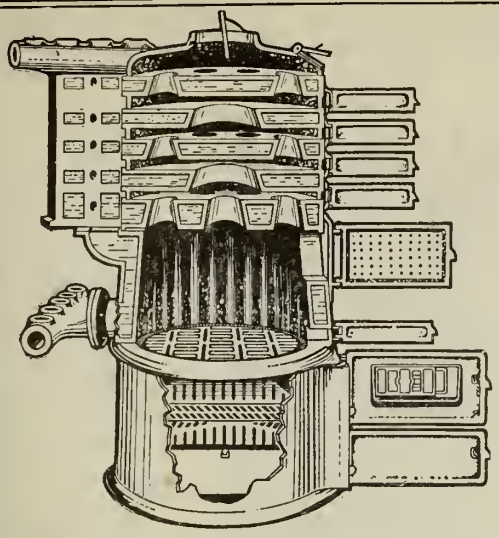
Manufacturers of every description of

Engineers,' Plumbers' and Sanitary Quality Brassware



The "Sovereign" Boiler Makes Better Business

Wherever the subject of conversation is house heating you will find the users of the "Sovereign" Hot Water Boiler speak with the greatest satisfaction.

No householder is going to put in a heating system without first knowing something about its merits, and these inquiries always lead to the "Sovereign."

Installing the "Sovereign" is, most of the time, just giving your customer what he is most inclined towards.

Several small improvements have been added to the 1919 model "Sovereign" that give it an extra detail of finish. Keep yourself posted on sizes, prices and capacities. We have helpful booklets and other printed matter.

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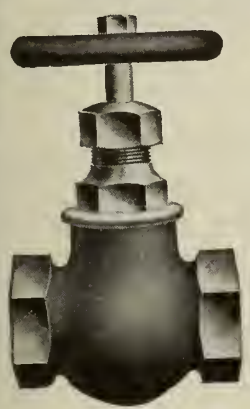

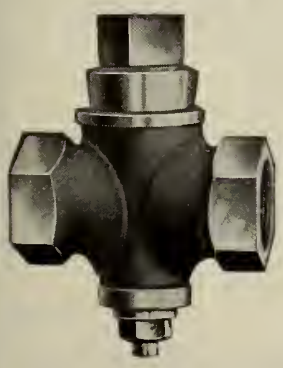

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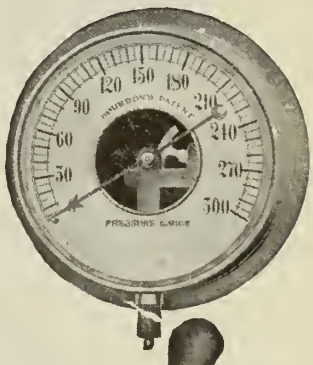
UNITED BRASSFOUNDERS AND ENGINEERS, LIMITED

EMPRESS FOUNDRY, CORNBROOK, MANCHESTER, ENG.



DURING THE WAR our plants were exclusively engaged on work of supreme national importance.

At the commencement of the new era we are pleased to announce that we intend to again direct our energies to the intensive production of:—

GUNMETAL and BRASS VALVES and COCKS.
STEAM, WATER and COMPRESSED AIR FITTINGS GENERALLY.
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"UBEL" POST-WAR SERVICE

If you are interested in any or all of the lines mentioned, and are in a position to take a hand in the energetic distribution of the same, please communicate with us NOW to our Head Office, at above address.

SANITARY ENGINEER
PLUMBER AND STEAMFITTER OF CANADA

ESTABLISHED 1907 — PUBLISHED TWICE MONTHLY

Vol. XIII. — TORONTO, JULY 15, 1919 — No. 14

CONTENTS

Carry the Stock; Let People See It	13-16
Great Activity in Building May Result in Delay Getting Equipment	16
Canada's New Bankruptcy Act	17-18
Current Events in Photograph	18
Inland Trade Commission Favored	18
Omissions in Architects' Plans Cause Diversity Prices	19
May Make British Goods in Canada	19
Editorial Comment	20-21
Saving Coal in Steam Power Plants	22-24
Much-Needed Plumbing May be Installed	25
Proper Sanitation First Aid to Housing in Town Planning	25
News From Here and There	26-27
Western Canada Industrial Congress	27
Heating and Ventilating—Radiators	28-29
Ventilating the Modern School	30
Salespeople of To-day and To-morrow	31
The Question Box	32-33
Practical Sheet Metal Work	34
The Markets at a Glance	36
Market Conditions and Tendencies	36-38

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Published on the First and Fifteenth of Each Month
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Baths,
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Solder,
Block Lead,
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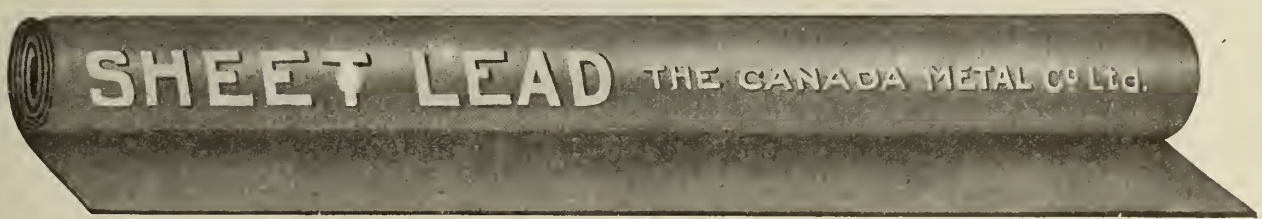
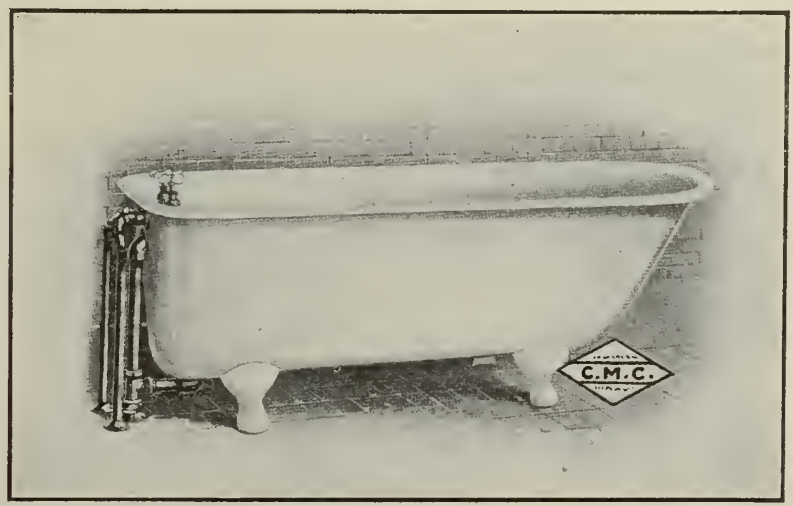
A Canada Metal Bathroom and Toilet



Not only do we manufacture a very complete and varied line of plumbing and metal supplies to meet every need of the trade, but it is our constant endeavor to give the utmost quality and money value in our products.



We have constantly before us the desire to help the dealer in every way possible and to insure him an ample return on any of our products which he carries. Our unusual facilities for prompt shipments are appreciated by all dealers.

THE CANADA METAL COMPANY, LIMITED

TORONTO, CANADA

HAMILTON MONTREAL WINNIPEG VANCOUVER

AN ECHO OF THE CONVENTION

Talking about the recent Convention of Master Plumbers held in Montreal, the conversation naturally drifted to Associations and their work, and in commenting on their work my companion said: "There is one thing that every writer on Plumbers and Plumbing seems to have missed, and that is the advantage of personality in the Plumbing business."

The speaker was a successful Master Plumber and a man of long and varied experience, and as his opinion was worth having it is passed on for your consideration.

In part he said: "When I started out for myself I made up my mind that I was going to get business, that I was not going to sit down and wait for someone to give me a job, but I was going out to get it, and the results were really surprising.

It was wonderful the number of people who were interested in good Plumbing and Modern Sanitary Fixtures, and I was there to tell them all about it. I gradually got the confidence of my customers and plenty of work, and my activities were not confined to small work alone, but my business gradually expanded and eventually I was called in, at my customers' request, to confer with Architects and Engineers about the Plumbing and Heating which they intended to specify and instal in their new homes and industrial buildings.

It was all personality. I took an interest in my customers and in their work, and it is only fair to say what is contrary to all that I ever heard, that I found them quite willing to pay me a fair price for my services."

"Of course," he continued, "I am no longer very active in the business, having passed it over to younger hands, but the policy which made the business successful is still maintained, with the result that the connection is ever widening and I really feel that the business has a valuable asset in the good-will of its customers."

The conversation is repeated as the experience is out of the ordinary and contains suggestions which should be very valuable.

When talking to your customer, recommend PORT HOPE Enamelware. You can talk well of it because it's good and carries an unconditional guarantee. Your customers will like it for its rich appearance, good color, and the ease with which it is cleaned.

Port Hope Sanitary Mfg. Company, Limited

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PORT HOPE, ONTARIO

Head Office:
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Established 1907 Circulates Throughout Canada

Sanitary Engineer
Plumber and Steamfitter of Canada

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"Carry the Stock, Let People See It"

Cowans, of Brantford, Have Two Model Bathrooms — A Special Room Where Only Electric Lamps Are Shown and Store and Window Displays—Steadily Expanding Business Has Been the Result of Enterprise

Based on an interview by C. E. PARSONS, of Sanitary Engineer, with C. D. Henderson of Cowans, Brantford, Ont.

ONE of the handsomest and most up-to-date stores in the whole province," is what anyone in the trade will tell you, if Cowans, of Brantford, Ont., is mentioned. Travellers will tell you that Cowans' is a "real" shop, with much emphasis on the real. Plumbers from other towns and cities who have gone over the shop will tell you that they only wish they had one like it. The best of all these encomiums is that they are all true. Cowans' is a real shop. The city of Hamilton, twenty-five miles away, is more than four times as big as Brantford, but there is not in Hamilton a retail plumbing and electrical shop that can even compare with Cowans'. In fact you may go all over Ontario and you will find very, very few plumbing and electrical shops that can be classed with it. Cowans' simply goes to show that it is the man behind a business and not the location of the business or size of a town that makes for success. If Cowans' were located in a town only half as big as Brantford the store would still be a model because of the methods that are followed and the principles along which the firm works.

Service the Foundation

When you come down to a final analysis of the steady growth and success of this firm you find that everything revolves around the word "Service." Service means a whole lot. It includes getting a stock of goods of unquestioned quality, fitting up an attractive place where buyers will want to come to see them, getting the buyers to come to that store, and then, after they come, demonstrating to them beyond question that you have the goods without which their homes are not complete. Getting a stock of really quality goods that are suitable to the needs of the community in which they are to be sold is not always as easy as it sounds. Making one's store the recognized centre for high-grade goods requires faith, courage and enterprise. Keeping the goods moving and sales steadily expanding requires salesmanship, not only personal but those results which come from a well-displayed stock, an attractive store and good advertising. Almost any one of these essentials to merchandising success may be found in the average store. It is the combination that puts Cowans' in a class that is a great deal above the average.

Quality an Essential

Quality is one of the essentials the firm insists on. It makes no difference whether you want to buy a glass globe for an electric light or to have an expensive heating system installed. The principle on which Cowans work is that the best goods must be furnished and the customer absolutely satisfied.

Not only is particular attention paid to the arrangement of the display rooms in Cowans' of Brantford, Ont., but full advantage is taken of the display windows as well. This is an attractive arrangement of electrical goods which this firm put in some time ago and which brought good results.

"Satisfied customers are perhaps one of our very best advertisements," said C. D. Henderson, the business manager, to SANITARY ENGINEER. "They tell one another and they send their friends. We have got a lot of good business from this source. As far as our other methods are concerned we believe in keeping our store absolutely as attractive as possible. There is no better way of stimulating sales than to get people into your store and then keep them so interested in goods which are of real value in the home that the desire to purchase is aroused. Many plumbing shops are anything but attractive. There is little or no effort made to induce people to "sell themselves" on things they see. Many plumbers are content to go along and make an installation or do a repair job without reaching out after the splendid business that is to be had for the going after."

Elaborate Displays

"Display" is one of the features that stands out at every turn in the Cowans' store. Before the prospective buyer comes in there is a most attractive window display that invites attention. Every article in it bears a price card. Every article is looking its best. and the window itself is shining. There is absolutely nothing dead about the window display. It suggests a live store where you will get good goods and good service. There is an appeal about a window display of this kind that involuntarily wins the average shopper, especially those who are seeking the better things.

"We try to get lots of action in our window displays," said Mr. Henderson. "I don't mean that we have a lot of me-

chanical contrivances in motion but we make the displays interesting. The things we show and the use we make of the advertising helps suggest to those who see the display what they will do. Everyone gets a mental picture of the things in action. People like to look at displays that suggest action and we have had the most satisfactory results from our windows. We keep it changed regularly and always try to have the seasonable lines before the public."

The Store Arrangement

The store arrangement throughout is most attractive, and Mr. Henderson says that this is another big factor in producing sales results.

"You cannot keep your store too attractive," said Mr. Henderson. "People like to buy in a place where everything is well displayed and clean and neatly arranged. It pays to carry a stock that will meet every requirement of the district.

"People like to compare one line of goods with another and make their own selection. They like to deal in a store where they can get lots of information about the goods. We always make a point of getting all the information we can about the goods we handle, what they will do and all the good talking points that help make sales. This is invaluable in keeping stock turning over. The salesman who knows all about his goods and has the right kind of stock has no trouble in selling it.

Aim to Sell the Best

"We are constantly aiming to sell higher quality goods. We try to educate our customers along this line and find them generally willing to listen provided we can convince them, and we usually can, that a dollar is neither here nor there in comparison with the service that is obtainable from a first class article. We always keep away from the question of price until we have explained all the good points of an article, and by that time the prospective buyer is usually in such a frame of mind that he sees that price is really not the important matter that he might have thought it was. If a customer comes in and says, 'How much is that vacuum cleaner?' we do not reply but ask him to let us show him how it works. We give a complete demonstration of what it will do and use all the talking points that are available in driving home the service he will get and the value that he will obtain by purchasing the machine, and so on. By the time we have finished we have aroused between our sales talk and the demonstration the desire in the man's mind to buy. We have convinced him that unless he has a cleaner in his home he is really missing something that will help make the home better. It is then usually a question of our machine or some other make, and we can refer anyone to a long list of satisfied customers who have bought our goods and know just what they can do. The prospective buyer knows most of these people personally, and if he gets in touch with them they will boost for our goods. The same thing applies to electric washers, a heating or plumbing installation, or any other thing. Satisfied customers are one of the best ads. any firm can have."

The illustration gives a general view of the interior of Cowans' store, showing how the stock of fittings, etc., is neatly kept in drawers. On the front of each drawer is a picture of the part cut from a catalogue.

The illustration shows the two model bathrooms in Cowans' store. These are fitted up complete, the equipment in one being more expensive than that in the other. These rooms have helped Cowans' turn over a lot of equipment of this kind and are besides a most attractive feature of the store.

Helps the Sales

In addition to their elaborate store display, Cowans' have three special demonstration rooms. One of these is a model bath room. It is handsomely furnished and equipped with the very latest fixtures and equipment. It is aimed to show people who want the very best just what a model bathroom should look like and also just exactly what they can have in their own home. A large show card in the centre of the model bathroom says:

"Up-to-Date"

"This bathroom is an example of the latest goods being installed in all the larger cities."

Another card says:

"Your home is judged by your bathroom; make it clean, neat and well-appearing with these small fixtures."

Handsome fixtures, all nickel-plated, lamp shades and lighting fixtures are shown, and the whole effect of the room is to make the prospective buyer think of the best goods and want them because it is obvious that they are not only ser-

Note the wall display of bathroom fixtures in conjunction with the bathroom equipment and electrical fixtures. An arrangement of this kind shows prospective buyers exactly how the goods will appear in their own home, a valuable selling point.

viceable, but beautiful, and an addition to the home.

In case, however, the prospect does not wish to spend quite so much money, the firm has another model bathroom immediately adjoining. This is equipped in a most attractive but not so elaborate a style as the first and contains complete equipment just as it will appear when installed in any home.

Produces Results

"These model bathrooms certainly produce results," said Mr. Henderson. "When people, who are going to build a new house or who are remodelling their old house come down here and see these rooms, they can see quickly just exactly what they can have, and we can give them the exact cost in a few seconds. They appreciate this sort of service. Besides this our goods speak for themselves. We are careful to handle only quality lines and goods that we can stand behind. Prospective buyers are quick to understand this when they see our stock and our store arrangement. It speaks for itself better than anything we can say, and automatically helps in backing up our general sales talk. They get the impression which we want them to get that we know our business thoroughly and that anything they get from us they can depend on. Our model bathrooms usually suggest ideas to people who are building or remodelling. There are any number of little points they see that they had not thought of. We find that they ask us about this or that and that they usually take our advice when it comes to deciding upon a purchase because they are satisfied that we will tell them what is best. We try to live up to this in every way."

Special Lamp Room

Immediately behind the model bathrooms is a special showroom for electric lamps. No other goods are shown in this room but electric lamps. There is as complete a stock there as one could wish to look over, big lamps, little lamps, plain lamps and fancy lamps, in fact all sorts of lamps, and at all prices. When a prospective customer has selected a lamp he thinks he would like, it is placed on a special display pedestal right in the centre of the room and connected, so that he can see just what it will look like. The pedestal is of wood and handsomely finished, and serves to enhance the beauty of the lamp.

"Our lamp sales have been most satisfactory," said Mr. Henderson. "We find them steadily increasing. In the last year we have sold more than two hundred, and the sales are getting heavier each season. They are big sellers at Christmas time for presents but we handle them steadily all through the year."

Sell Many Washers

Electric washers are another good seller, Mr. Henderson says. The firm holds demonstrations on these machines, and a feature of the demonstration is a window display. In this, machines are put in actual operation in the window with an experienced lady demonstrator in charge. Of course this brings in a lot of prospects and many sales are usually made. A list of prospects is also obtained, and these are closely followed up.

Cowans' electric iron sales average two hundred each year, and Mr. Henderson says this will be increased. Irons are displayed at various points in the store on display tables, on ironing boards and at other points. Throughout the store are placed show cards with such inscriptions as "True economy lies in buying good things."

Believe in Advertising

"Our newspaper advertising and our window displays are the two best mediums we have of bringing people to our store," said Mr. Henderson. "We advertise regularly, using usually from half page space to whole pages, depending upon seasons and specials we may be offering. We have tried movie slide ads., but I would not say that they are good. We always get direct and very satisfactory results from our newspaper efforts. We try to keep our offerings interesting, attractive and seasonable, and we know from the questions that are asked by people who come into the store that the ads. are read, and read carefully."

Merchandising Pays

As will be seen from the accompanying photos, electrical fixtures are a big line with Cowans'. They have carried

This photo shows the attractive arrangement of stock in the front of Cowans' store at Brantford, Ont. Note the effective arrangement of fixtures and bathroom equipment. At night when all the lights are turned on the effect is even more striking.

them ever since electricity displaced gas a few years ago, and before that the firm carried a full line of gas fixtures.

"We go right after the merchandising side of the business," said Mr. Henderson. "It not only pays, but pays well. So many plumbers centre their efforts on plumbing and plumbing only. We have found that it is most profitable to handle electric fixtures, electrical utilities, and other lines. It means all year round business. There are no dull seasons. If the plumbing business is quiet we are still turning over our stock, and as all the lines carry a good profit we are making money all the time. Aside from that the handling of fixtures and other lines brings other trade. Hundreds of people know about our stock and our store that probably never would have heard of us if we only did plumbing."

Eliminating Repairs

Cowans' are in line with the policy that many of the most progressive plumbing firms are adopting, that of making every one of their employees a salesman. For instance, if a man goes out to a house where he has been called to make repairs, in the great majority of cases he does not make the repair at all. He sizes the job up carefully and usually advises the party to put in a new part. Very often not only a new part, but modern plumbing or complete rearrangement is suggested, and in every case the arguments for this are backed up by convincing reasons. It has been found that by following out this policy in general that much good business is obtained and that the property owners get much more satisfactory results. Most people are very reasonable about suggestions of this kind, Mr. Henderson says, and would far rather pay a little more and get a new part and a satisfactory job than to pay a fairly heavy price for repairs and then have to do the thing all over again in a short time.

System in Shop

It should not be gathered from what has been said that Cowans' are actively interested only in the retail selling end of the business. The practical end, that is, plumbing and heating and repairs, is looked after just as thoroughly.

A stock is carried that is considered ample to meet every requirement. For instance, there is a pipe rack that will hold a whole car load of pipe. There are 1,000 bins of fittings of various sizes, and complete equipment for doing work expeditiously. A power pipe cutter reduces shop costs on this work to a minimum. This machine, an emery wheel, a drill, and other accessory tools are all electrically driven. The firm believes in having the tools to do whatever work is required, and it also believes in looking after them. The workshop is kept neat and clean. The tools are kept in good working order and clean. There is a special room with a special man in charge for the small tools. Every workman who gets a tool out to do a job gets a bill, which is checked up with the time it is taken out and returned. In this way tools are not only kept track of and are not lost or mislaid, but if workmen are careless and break tools repeatedly the firm soon knows about it.

Supplies in Bins

There are neat and well-arranged bins for supplies. Instead of fastening one of the pieces to the front to show what the bin contains, a picture taken from a catalogue is pasted on the front of each bin. This saves stock and answers the purpose just as effectively.

"A whole lot of money can be made or lost by running a shop properly or by letting things slide," said Mr. Henderson. "We find that by working along the lines we do and by having the proper tools to do work quickly, we can figure much more closely on work and make more money."

So far, Mr. Henderosn has not been greatly impressed with the possibilities of the Ontario Housing scheme.

"It does not look to me as if it would work out," he stated. "It is hard to overcome a natural condition with an artificial remedy."

Great Activity in Building May Result in Delay in Securing Plumbing Equipment

Impossible to Get Unskilled Help, Declare Manufacturers—Much Difficulty is Also Being Experienced in Getting Molders—In the Meantime Orders Continue to Pour In

"THE situation has completely changed. Four months ago we were wondering if we would be able to keep going all year. Now, orders have been coming in so briskly that we have enough to keep us working to capacity for six months, and more business is coming in all the time."

This is a paragraph from a letter written by a manufacturer of plumbing goods to a firm in Toronto. It pretty well sums up the situation.

Help is Scarce

"One of our big troubles just now is to get help," said the head of a large firm making enamelware. "It it practically impossible to get molders. With the harvest coming on it will be more difficult than ever to get unskilled help. Business has opened up splendidly and we have lots of work ahead. We are not going to be able to keep up with our orders because we cannot get men. The men that we have are working shorter hours than ever before and drawing higher wages. In the past four or five years there have been few apprentices, and there is no one to take the places of the men who have left. To add to our troubles we are finding difficulty in securing materials in quantity because so many stocks are low and there are such big calls from all over the country."

Lots of Building

The splendid manner in which building has gotten under way has been a big factor in creating the demand for plumbing goods that is now making many of the manufacturers wonder how they will get the goods. In all parts of the country new residences are being erected and the majority of them are of the type that require plumbing goods. Many thousands of these homes are already started and many more will be built. With the signing of peace a great deal of building in connection with the larger projects was released. Many of those who were planning big jobs would not proceed until they had definite assurance that conditions were likely to be such that they could proceed without any such interruptions as have been frequent during the past five years.

Architects Busy

All over the country architects are very busy. Many of them have more work in hand than they have handled during the past five years, and more projects are being developed all the time. Just how long this condition of affairs will continue cannot be judged now. Whether it is just a spurt caused by the holding up of so much work during the war, or whether it is merely the start of a construction programme that will continue to develop, remains to be seen. There are those who hold diametrically opposite views. Some take the stand that in a year or so all demands for housing will have been met at the present rate of building. Others are looking for an unprecedented period of prosperity that will last for many years. One thing is certain, there never has been so much ready money in circulation in the country in general. In a great many places there is no question at all that the building which is under way and planned for this season will not be ample to take care of the requirements. Even with what is being done by private parties and housing commissions there will still be a great demand for reasonably priced dwellings.

The Coal Situation

Some manufacturers are beginning to get anxious over the outlook for coal. Reports from the mining centres are not reassuring in regard to supplies. No less than 40,000 miners, it is stated, have left for Europe in the last four months. It has been impossible to replace these men, and as a result the normal production of coal has been greatly lessened. Some of the manufacturers who have been trying to arrange to get in supplies of coal that will see them through the winter have not met with much success, and they are wondering just where they are going to get off at.

Canada's New Bankruptcy Act

First Uniform Legislation for Dominion in Forty Years—Will Lessen Expense, Make Proceedings More Speedy, Abolish Unfair Preferential Treatment, Provide Honorable Discharge—Retailers' Wishes Recognized.

Hon. Hugh Guthrie, Solicitor-General, before Montreal Merchants' Association

THE new Dominion Bankruptcy Act is due to the fact that for the past forty years there has been no proper Bankruptcy Act covering the whole Dominion. Russia and China, along with Canada, have no general Bankruptcy Act, but all other civilized countries have. There has been no Dominion law since 1878, and in the interval the various provinces have passed insolvency laws, but the trouble was that these were not uniform. Men who did a national business experienced difficulty through the variety of insolvency laws, while exporters in Great Britain said they could not secure uniformity in their claims with the preferences and priorities that were allowed in the various provinces. The demand for a Dominion Act came from the Boards of Trade, the wholesale and retail houses, the Bankers' Association, and many other bodies all over the country. Under the old Dominion Act, which lasted only for five years, the machinery for winding up an insolvent estate was very cumbersome and slow, the expense was too great, and the difficulty was that the assignees were not a class of men that would make good trustees, and very often no dividend was declared on the estate. The matter of expense as well as lack of uniformity was one of the difficulties with the Provincial Act, and one instance was given of a case in British Columbia where an estate of $730,000 brought only $3,000 for distribution to the creditors.

Voluntary and Involuntary

The Act as it is being passed by the Commons and Senate provides for two kinds of bankruptcy:

1. A voluntary one, for any man may make an assignment to a trustee under the Act.

2. An involuntary one, where the man is placed in bankruptcy against his own will. This applies to all except wage earners with less than $1,500 a year, and to farmers, who cannot be put in bankruptcy against their will.

There was an effort made to limit the application to traders, such as is the case in France, and was the case under the old Canadian Act, but experience has shown that this should be broadened and the Act in Great Britain applies even to farmers. The retail merchants declared that such a limitation to traders would be unfair to them, and that there should be a very general application. They told us that doctors and lawyers, professional men generally, preachers and university men were the biggest debtors so far as far as they were concerned. Thus the Act was broadened. So far as the farmer was concerned it was argued that he might be the victim of hard luck one year; he might be hailed out, and if he were compelled to give up his farm and stock he would have no chance to right himself, so he was exempted.

Where Debt Exceeds $500

The bill, as it went through the Commons, applied where indebtedness was $200 or over, but the Senate increased this to $500, and the Commons is agreeing to this; that is where a man owes $500 or over and refuses to pay.

Jurisdiction is vested in the Superior Courts of each province, and a few cases of appeal are allowed.

Choosing Trustees

Trustee—Anyone may apply to the Secretary of State for Canada, and the appointments are made by the Governor-General-in-council. Many chartered accountants have made application, and these will be assigned to districts, but all property, no matter where it is located, will be vested in the trustee. Each one must give a permanent security for $10,000. In the case of an individual estate the creditors may compel him to give an added security for the value of the estate.

The Act provides whereby an honest debtor may receive a discharge where he has not been guilty of impropriety, where he has kept a proper set of books, where he has given up all his assets and in fact has acted honestly, he is entitled to a discharge by a court which would be good against the world.

The procedure—The petition is presented to a court, which will have it served on the debtor, and in eight days the judge appoints a trustee who takes charge, under the supervision of the creditors and inspectors. The trustee must report to the court, and his security is not given up until the whole case is discharged.

Fees are Limited

Payment to trustee—The trustee may be given the creditor's vote or he may be limited to an amount under the Act which will not exceed five per cent. of the estate that is in his hands.

Lawyer's fees are likewise limited by the bill so that the estate will not be "gobbled up." The inspectors are allowed only their disbursements. In the case of lawyers where an estate is over $5,000 they are allowed 5 per cent., where it is under $5,000 not more than 10 per cent., and only the 10 per cent. if the inspectors agree.

Stringent provisions are made against preferential settlements or cases where fraud exists. The clauses are based largely on the English Act, and vary greatly compared with Ontario and Quebec Acts. Speaking generally, all cases of fraud or attempts to delay or any preference that is given one creditor over another are set aside, and if the money has been paid it may be reclaimed. Everything has been done in order to assure that the full benefit of the assets may be divided share and share alike, without preference or priority.

In regard to joint stock companies, the banks, railways, trust companies, and insurance companies, for which there is special legislation, are excepted. One of the difficulties under the present Act dealing with joint stock companies, is that it is difficult to settle the list of contributories. The new Act provides a very simple means; the trustee takes the books and settles the list of contributories himself. In the case, for instance, of John Brown, who has paid $60 each on his shares, he is called on to pay the remaining $40, and if he does not he can be sued in court within 30 days, and no new defence is allowed that was not in the original plea. This method is much more expeditious and less ex-

ITS MERITS

The analysis of the new Canadian Bankruptcy Act by Hon. Hugh Guthrie was given at a meeting of the Merchants' Association of Canada, held in Montreal, at which a staff member of SANITARY ENGINEER *was present. Mr. Guthrie declared that the new act would grant uniformity, secure speedy, cheap and reliable proceedings; abolish preferential or priority creditor abuses; grant an honorable discharge to a deserving debtor, and work out beneficially to the commercial and financial interests of Canada.*

From the point of view of merchants it is gratifying to note that they won out in their protests against the limitation of the act to "traders"; now it includes the "professional" classes as well, many of whom they described as their "worst debtors."

Current Events in Photograph

First Dirigible to Cross Atlantic

The photo gives a good idea of the great size of the R34. It was taken shortly after the explosion which tore the dirigible from her moorings. The explosion was caused by the gas in one of the front sections becoming heated by the sun. It tore a section of the outer skin thirty feet long from the forward lower surface of the gas bag. This accident has delayed the return trip of the huge aircraft. But it is now on its way, having left Wednesday at midnight.

pensive than under the present procedure.

The priorities allowed are as follows:

1. Expenses of trustees as a first charge.

2. Costs in obtaining judgment are allowed to the first man who has secured execution against the company.

3. Three months' preference only to wage earners.

4. Taxes due to provincial or Dominion Governments which are declared a lien on the property and must be paid.

Landlords Three Months Only

In regard to landlords—A change has been made in the law as it is in the Province of Quebec regarding landlords. As a result a criticism has been brought up that we are too hard on the landlords, while on the other hand the claim is made that they should rank as ordinary creditors. We have decided to allow the landlords three months' preference only on their claims. Again the criticism is raised that as soon as the law takes effect you will see all rents payable in advance. But that is not a hardship and as a matter of fact, in New York this is the custom in force. If more than three months rent are due him he will be treated as an ordinary creditor and obtain his dividend with the rest.

The main objects that will be obtained by this Act are thus:

1. It will grant uniformity in bankruptcy acts for all the provinces.

2. The proceedings will be as speedy, as cheap and as reliable as possible. wholesaler, got a square deal.

3. It will abolish preferential or priority creditor abuses.

4. It will provide for the honorable discharge of an honest bankrupt.

5. The whole Act will work out to the financial and commercial interests of Canada.

It may be six months or more before the Act is put into actual operation. The consensus of opinion is that a reasonable time should be allowed to pass before it comes into effect. Practice forms must be drawn up, rules of practice approved of, trustees chosen, etc., but in six or eight months the bill will be proclaimed as law and come into force.

Inland Trade Commission Favored

R.M.A. Secretary Advocates It Before Cost of Living Enquiry

Ottawa, July 12. (Special.) — Among those who gave evidence before the Cost of Living Committee at Ottawa the past week were E. M. Trowern, secretary of the Dominion Retail Merchants' Association. He said that he had been in this position for 25 years, consulting with 55 different sections of the retail trade. He said the trade had been badly handicapped because the retailer is not familiar with the wholesale and manufacturing end, and finds it hard to get the facts. This often causes dissatisfaction. He said the retailers had been asking the Government for the past ten years to create some sort of an Inland Trade Commission, modelled after the Federal Trades Commission of the United States, but, taking into consideration the difference in our laws. Mr. Trowern read to the Commission a paper on this subject. He thought the policy of the Government should be to see that everyone, from the consumer to the wholesaler got a square deal.

He would advocate giving such a commission as he proposed all the power now given under the criminal code, which cannot now be operated. The man who wanted to fix prices should come before the board and make his case. Suppose the retailer has the suspicion that he has been paying too much for some article, he can get no explanation, but suspects the manufacturer is taking advantage of the market. That would be a matter for the Inland Trade Commission to take up. The retailers would lay the evidence before them and they would call the party concerned before them and find out if advantage were being taken of the market. Then an order could be passed saying that profits were excessive, and a price could be fixed fair to all. If it is found out that the profits are not excessive, the public mind is relieved. The whole question of the tariff and everything else relating to the question might come under the proposed commission.—T.M.F.

Omissions in Architect's Plans Result in Varied Quotations

Not Always Price-Cutting, But a Different Interpretation of Work Wanted That Results in Low Figures, Says Windsor Man—Plumbers Should Have Appreciation of What Their Position in Community Is

MUCH has been written of the discrepancy in quotations which different sanitary and heating engineers will submit for the same work. Some have said it is plainly and simply a case of price-cutting, that a full appreciation of the work to be done and its value was not apparent. That the lumber or heating engineer wanted to beat the other fellow to it and was willing to sacrifice his profit or do cheap work to accomplish his end.

Plans Incomplete

But are all these "bouquets" being handed to the trade justified? Is the sanitary or heating engineer being judged fairly? Isn't there a chance that there may be another reason for the great variation in prices asked? In the opinion of M. A. Brian, Windsor, Ont., there are architects who fail in supplying proper plans and specifications, with the result that the interpretation of same may easily vary and quotations submitted as a result of the incomplete information on plans thus show wide variance.

What One Plan Showed

A representative of SANITARY ENGINEER recently called on Mr. Brian and this matter was one that he believed should come in for correction. "Just look here," stated Mr. Brian, "and I will show you just what I mean. Here is a set of plans which I call good. You will see in looking these over that first of all the position of the house on the lot is given. In that way it is easy to determine the pipe needed to connect up with the water mains and the sewer pipe required, also the amount of excavation work this will entail.

"Here again are separate layouts for the basement, first floor, second floor and attic. Every fixture wanted is shown, the position of every fixture is marked—such specifications enable me or any other plumber or heating engineer to figure correctly. I do not know, but I venture to say that the prices sent in on this job will show very little difference.

These Were Different

"Compare those plans then with these I have here," continued Mr. Brian, drawing forth another set which he had for a plumbing installation on a small factory. "In these plans of the factory there is absolutely nothing to indicate the equipment wanted, nor the position of the various fixtures. I figure this work may run up close to $1,000; I figure also that there may be a quotation as low as $800. Not because another plumber is trying to cut my feet out from under me but because they have not dug into the matter as closely as I have. The result will be that they are given the work, and when they get at it they have all this equipment they never figured on to install, and are out as a consequence a whole lot of money."

Eliminate Guess-Work

There in a nutshell is one of the main causes of the present diversity of quotations according to Mr. Brian, and it is easily understood how this lack of information on the plans submitted may have just this result. Mr. Brian appreciates the fact that there is some price-cutting going on, but thinks this will be overcome when the trade are given plans which leave no room for guesswork or an opportunity to turn in different interpretations.

The Windsor craft are organized now and good results are expected from these get-together meetings. One good result expected is that the trade will find out that the other man is human, too, that he is facing problems and that they have many interests in common which can be discussed.

Plumbers' Position

"When the trade realize the importance of the position they occupy in the life of a well-organized community, we will all be better off," stated Mr. Brian to SANITARY ENGINEER. "The plumber has been called a robber and thief and all kinds of other uncomplimentary names, and he has calmly accepted it. Let me tell you no man can apply those names to me and get away with it. I am in business to make a success; my prices are fair in line with the work I do, and no man can trample on me and my calling without running right into trouble. The sooner we all stand up on our feet and choke off any person who seeks to malign us, the better for the trade as a whole. The plumber is a mighty important man in the community, or at least should be. In fairness to himself and his fellow members he should lose no opportunity to do a little advertising on just what a strong link in his local industrial chain he is."

May Make British Goods in Canada

British Manufacturer Looks Toward Canada With New Vision — Changes Will Assist in Greater Production — War Creates Broader Views, Say Steel Company Officers

MR. BEVERLEY ROBINSON, president, and Mr. Hugh Kearns, managing director, of B. & S. H. Thompson & Co., Ltd., Montreal, have just returned from a four months' business trip in Europe. They visited the British Isles, France, Italy, Sicily, Switzerland, etc.

During an interview with SANITARY ENGINEER, Mr. Kearns stated that the attitude of the British manufacturers has undergone a very great change with regard to Canadian business. They realize now that they must be prepared to meet the conditions of the trade in this country, the unwillingness to do so in the past having diverted a very great proportion of the Canadian trade to Germany.

Labor—New Equipment

British manufacturers freely admit that labor in the past did not get the share of profits which they should have, but this condition is largely accounted for by the competition which grew up among themselves. It is recognized that cheap labor in the past will not be available now, and to offset this many of the progressive manufacturers are installing new and up-to-date equipment in plants which had become obsolete.

The labor troubles have been serious, but Mr. Robinson and Mr. Kearns were told by a gentleman who had been on one of the Government committees which negotiated with organized labor during the war, that the labor leaders in England, contrary to the general idea, are extremely reasonable and patriotic men. Difficulty is experienced by these labor leaders in controlling their people at all times, but with this class of men directing labor, and the common sense of the British people, the labor situation would undoubtedly be straightened out.

May Build in Canada

A number of British manufacturers intimated their intention to manufacture in Canada in order to secure their share of our trade, and a great many people in the various walks of life, whom Mr. Robinson and Mr. Kearns met, intimated their intention of migrating to this country.

Great Britain is recovering much more quickly than the other countries which Mr. Robinson and Mr. Kearns visited. On the continent there is an extreme shortage of coal which is greatly hampering the return of commercial activity, and, of course, conditions there have been much more upset by the war than in Great Britain, because of their closer proximity to it.

Now that peace is definitely settled, an era of prosperity should be confidently looked for, our having become better known in Europe through Canada's wonderful record during the war will contribute to this.

EDITORIAL COMMENT

THE CRAZE FOR FACTORIES

THERE are municipalities in Canada that are willing to give the shirt off their back in order to secure industries.

This is not a new disease, but it seems to be like the measles in that there is no telling when it is going to break out in a fresh place.

For a number of years the cry of the municipalities has been, "We must have industries." They have in many cases lost sight entirely of the fact that industries go where conditions are favorable for their development. They fail to recognize the history that has been written all over this country of the fool industry seeker.

There are taxpayers in scores of Canadian villages, towns and cities who are even yet putting up their good money for some idiotic scheme that was foisted on the place years ago, and the only memory they have now is the taxes they pay for their foolishness. It is not correct in many cases to say that these concerns were "foisted" on the municipality. Too often the municipality was out looking for the proposition. It was a happy time for the promoter who had a real lemon in his pocket. It was not hard for him to find places that would listen to him. He would give employment to one hundred people, he would do this, that and the other thing. Well, if he failed? Municipality had the building or the plant, if there happened to be a plant. They might have an asset and they might not. They certainly had a liability in the money or loan they had made.

But this thing still lives. Only a few days ago a Canadian city had a letter from an American concern. This firm happens to be all right. It has been planning to come to Canada for a branch business to handle export trade. It is coming no matter if the municipalities make concessions or not. If they have to pay their own way they will do it. That firm right now has four wonderfully favorable propositions before it. They are being offered for nothing what they were prepared to pay for.

Here is another and perhaps a more concrete case, because we are able to publish some of the correspondence. In this instance a Canadian city, quite an industrial place, wrote to an American plant, intimating that they had heard they were going to open a business in Canada, and on the strength of that taking the opportunity of pointing out the advantages of this particular Canadian centre.

It was only a few days after that the city received the following letter from the U.S. firm:—

"Replying to your letter of the 14th ult., will say, that we now have before us a Canadian proposition, in which this particular city has offered us ten acres of land on a railroad siding and have agreed to build on this land a one-story fireproof factory to contain 30,000 square feet, and turn same over to us, free of charge, and give us water and taxes free for ten years. The Hydraulic Power Co. have agreed to give us electric power at ½c per K.W. hour. In return we are to start operations with at least 100 men and to agree, in case we discontinue during the first ten years, to return the property to the city.

"If you have any better proposition to offer, we would be pleased to receive it, and give it due consideration."

Now there may be some few details that were lacking in the offer that was made to the company. They might have been offered free hay and oats for the first six months, free street car rides for the employees and a twenty per cent. discount on their grocery bill at the corner store.

But after looking over what that Ontario town is prepared to do, one might well be prepared to lean back and say, "If you know of a better 'ole, go to it."

BUSINESS COMES LAST

THE calm admission by Hon. Hugh Guthrie, K.C., before the Merchants' Association of Montreal, that for forty years there had been no proper Bankruptcy Act covering the whole Dominion shows how little attention Governments pay to business interests. Russia, China and Canada, said Mr. Guthrie, were the only countries without legislation of this kind. All other civilized countries had it, he declared. The trouble with too many of the men who go to Ottawa seems to be that they are too busy pulling strings to have any time at all for helping business. In fairness to some of the elected representatives, it might be stated, that they have not the slightest appreciation apparently of the problems that retailers and other business men are facing continually. The new Bankruptcy Act will facilitate matters in some lines greatly. It is being passed largely as a result of the combined efforts of the wholesale and retail firms of the Dominion, the Bankers' Association, and other organizations. Had these men not got busy the Government would probably have slumbered on for another

forty years, or perhaps for 140 years before it did anything on its own initiative to help business men. One thing busy merchants and others interested in commercial pursuits have to learn is that if they want to get anything done at Ottawa, they have to initiate it and practically put it through themselves. Even then, very often the progress is impeded owing to official red tape, indifference and just plain ignorance.

STRIKES ARE EXPENSIVE

WHILE it is too early yet to make any accurate estimates of what strikes have cost Canada this year, it is certain that the loss will run into several millions. Business men are always directly affected when any large number of men go on strike and big plants are tied up. In the case of Winnipeg it will be many months yet before business recovers from the effects of the walk out there. In the street car strike in Toronto, although it lasted not quite two weeks, down-town merchants lost heavily. No stores, it is stated, were hit harder than the big department stores. Business men who have discussed the situation with SANITARY ENGINEER urge the necessity of evolving some plan by which differences can be arranged without the men ceasing work and plants tied up. Many of them declare that so far as practical results are concerned the present plan is not a great success. In spite of the machinery that is supposed to exist at Ottawa for arranging disputes thousands of men have quit work and scores of plants and millions of dollars' worth of machinery have been idle. This is where the greatest loss occurs. Another big loss aside from the production standpoint is to the workers themselves. It will take many of them months at full time to make up for the time they have lost. In England the Whitley plan of settling labor troubles has been adopted and from reports is working satisfactorily. It is likely that an effort will be made to investigate this plan and have it tried out in Canada. In the meantime, it is encouraging to know that good progress is being made in settling numerous strikes all over the country.

THE SPEED AGE

MANY people who in watching the developments of the past ten years in bicycles, motor cycles, automobiles and aeroplanes expressed the view that the world was moving too fast, are waking up to the fact that the real speed is yet to come. When aeroplanes during the war frequently exceeded 120 miles an hour, easily outdistancing the fastest express trains, many people thought the limit had been reached. Some of the huge new planes that are planned for commercial purposes will make those 120-mile-an-hour planes look like lumbering old stage coaches. As a result of the developments in air service the world is contracting rapidly. Just what the next ten years has in store it would be most interesting to know. Certainly there is every indication that under the impetus given aeroplanes through the war they are to play a big part in the commerce of the future. Not only aeroplanes but dirigibles. The successful trip across the Atlantic in 108 hours of the big British dirigible R 34 opens up some tremendous possibilities, especially when it is remembered that this is much faster time than the speediest of the Atlantic liners can make the trip in. And the cost of operation is not to be considered. All air routes which will clip days and in some cases weeks off the present schedules of trains and ships, and which will put the most distant points within easy reach, are now being planned and materialized so rapidly that it will only be a short time before the trips are actually being made regularly. Just what this means to business men in time saving and in the delivery of mail, to say nothing of merchandise, cannot be estimated. It is especially gratifying to know that the leader in this great new development is Britain and that improvement after improvement is being made which brings air travel ever nearer to the point where it will come into general use and be devoted to the service of hundreds of millions of people.

WHY NOT STOP THIS?

FROM time to time SANITARY ENGINEER has mentioned the serious fire losses in Canada, most of which are directly traceable to carelessness. At the present time reports from Northern Ontario indicate that enormous losses are occurring there through forest fires. Fortunately, so far there have been none of the harrowing tales of scores being burned to death that have so often come out of the north country. This fire loss, which has been occurring annually, and runs into millions very often, could in the opinion of many of those who have looked into conditions be practically eliminated if the Ontario Government took the necessary steps. Why such a terrific loss should be allowed to occur each season and demoralize business conditions in many northern towns, to say nothing of adding to insurance rates, if an efficient system of forest protection can be established, it is difficult to say. It would appear that it would be more than worth while for the Government to remove this menace if there is any way of doing it. Each year is seeing a substantial growth in Northern Ontario. In mining alone the past twelve months has seen a tremendous development to say nothing of agricultural and lumbering interests. The north country is rich, but one of its terrors has been the forest fires. This has impeded development unquestionably. The losses from the fires have gone a long way towards making Ontario's fire loss one of the largest in the world per capita. It is time, it would appear, that somebody got busy and studied this problem.

Saving Coal in Steam Power Plant

Economy in any power-plant proposition absolutely demands definite knowledge (1) as to whether coal would be saved by purchasing power on the one hand or generating the power in a privately owned plant on the other hand, and (2) if the decision is in favor of the latter alternative how to save coal and obtain maximum production with minimum waste.

The object of this bulletin is to set forth the underlying principles, the determining factors, and the method of applying them to the problems in hand in such manner as to be of greatest service to the owner, manager, and engineer.

Isolated Plant Versus Central Station Power

If the available power purchased or privately generated is obtained purely from a hydro-electric service its use will, of course, save fuel over any steam-power proposition. If, however, in a steam plant all the exhaust steam were sufficiently utilized the boilers would still have to be operated at about 90 per cent.[1] of their former output to supply the heating steam (even if at low pressure) if the engines were shut down, and the saving in coal would be only 10 per cent. instead of 100 per cent.

B. If the purchased power is produced in a central steam plant capable of delivering a kilowatt hour for, say, 2½ pounds of coal, then its use will waste or save in comparison with a private steam plant, as follows:

B-1. If all the exhaust steam from any design of private plant is absorbed by heating and process work, no central power station[2] of condensing operation can ever be designed to compete with it in the matter of coal consumption.

If the engines in this private plant were all removed it would still require 90 per cent. as much coal as formerly to make low-pressure steam for heating, and outside current at 2½ pounds per kilowatt hour would still have to be purchased.

If the private plant had been using 8 pounds of coal per kilowatt hour it would save eight-tenths of a pound of coal, to replace which it would buy current costing 2½ pounds. Thus, for each pound saved in the private plant 3⅛ pounds are burned in the central station. This example represents the extreme case in favor of the private plant.

B-2. If the same private plant operating noncondensing wastes all of its exhaust steam, coal will be wasted in the ratio of 8 to 2½ per kilowatt used. Coal will be saved by substituting purchased power. This example represents the extreme case in favor of the central station current, and the ratio is 8 to 2½ or 3.2 to 1.

To sum up cases B-1 and B-2, the use of exhaust steam is the determining factor. Where it is all used the small private plant generates its energy as a by-product of its heating. The engine or turbine acts as a pressure reducing valve between the boiler and the heating system, and abstracts a small percentage (3 to 12 per cent.) of heat from the steam. Therefore shutting down the engine will save only this small fraction of the total coal. For most cases of this kind it is safe to say the engine absorbs less than 10 per cent. of the heat or fuel. As a matter of fact, many cases could be quoted where no saving of coal occurs when the engines are shut down[3].

[1]Exhaust steam contains, within a few per cent., as much heat as direct steam. Thus an engine or turbine with steam consumption of 20 pounds and 60 pounds per indicated horsepower hour will discharge in their exhaust about 88 to 96 per cent. of the heat of the steam admitted at their throttles respectively. In the examples given 90 per cent. is assumed.

[2]Operating condensing in accordance with standard practice. If a central plant were designed to furnish exhaust steam to its customers it could then compete on a coal basis with the private plant. This is the sound theory of the "city block" or "district" system of power and heating.

[3]There are sound technical explanations for these cases, but it is aside from present purposes to enter into a detailed discussion.

[4]The proportion of exhaust required for heating represents almost the same proportion of coal which will have to be burned for direct steam heating if the engine is replaced by purchased power.

[5]Equal coal consumption obtains when the proportion of total coal required for heating alone equals one minus the fraction obtained by the ratio of the kilowatt hour coal consumptions of the isolated plant to the central plant figured from the purchaser's switchboard. Example: With purchased current at 4 pounds of coal and private power at 7 pounds, an equal coal consumption with either system will obtain when the proportion of coal required for heating is 1 minus 4/7 = 3/7 of the total coal.

Hence for purposes of approximate calculation the power is a pure by-product of the heating. But assuming 10 per cent. of the heat of the steam to be taken by the engine, then only 10 per cent. of the coal consumption will be saved if the heating is done by direct steam. Eight pounds of coal per kilowatt hour, the figure assumed, is based upon an extravagantly wasteful boiler plant, but even under these conditions the small private plant using all its exhaust would save coal over central station current for power ratio of 3⅛ to 1.

If on the other hand no exhaust steam is used in the same private plant, the saving in favor of the central station power is in the ratio of the coal used per kilowatt hour for the two cases, or with the figures assumed, 8 to 2½, that is 3.2 to 1.

It is evident that in a noncondensing private plant, as the use for exhaust steam decreases a certain point will be reached where the same coal consumption would obtain by the generation of power by either type of plant. A still further reduction in the utilization of exhaust would then throw the balance in favor of central station power.

This critical point of equal total coal consumption depends upon the coal consumed per kilowatt hour in the private plant and the central plant, respectively. Thus if the central station has a coal rate of 3 pounds per kilowatt hour and the private plant 6 pounds, the critical point is reached when 1 minus 3/6=1/2 of the exhaust or coal is needed for[4] heating, and the same total coal will be consumed whether the power is purchased of the engine operated. If less than one-half of the exhaust is used, the purchased current will effect a saving; if more than one-half of the exhaust is used, running the engine in the private plant will save coal.

Take another case and assume that current can be supplied at the purchaser's switchboard for 2 pounds of coal, and that the small plant produces it for 5 pounds. Then, if 1 minus 2-5 = 3-5 of the coal or exhaust is needed for heating no change in total coal consumption will occur if current is purchased, the engines shut down and boilers operated for heating only[5].

If the coal per kilowatt hour for outside current is less than the same figure for the private plant, the most coal will be conserved by carrying just enough load to furnish exhaust for the heating and buying the surplus power. Thus the small plant obtains a part of its power as a by-product of its heating and buys the balance for the least total coal consumption. This method saves more coal than shutting down the small plant entirely, even when a saving would be thus effected. There are many cases where at night or during non-heating months where an important coal saving can be made by buying the power which is in excess of that required to furnish exhaust for heating.

Still another situation is met when the private plant is of modern design and operates solely for generation of power. Such cases would be determined purely on a comparison of the coal consumed per kilowatt hour. Central station power is produced at consumers' switchboard from a minimum of about 1¾ pounds of coal in the largest and most modern plants up to 3 pounds, 4 pounds, 5 pounds, and upward in less efficient stations.

In moderately large private plants of good design a kilowatt hour is produced for a little over 2 pounds, while less efficient and smaller plants consume up to 10 pounds and over. In this whole problem it is necessary to regard coal as the basis of economy and not money as heretofore. Central station interests and private consumers should patriotically endeavor to meet each other half way in sacrificing by reduced rates or increased expense when important economies in coal are at stake.

PART II

After due consideration has been given to the question brought out in the previous discussion and if it has been determined that the plant is justified in continuing to operate, attention must be given to those points having a bearing on economical operation. No transformation of energy can take place without appreciable loss, and every effort should be made to keep the various losses down to a minimum. Diagram A shows a typical distribution of heat in a medium-sized hand-fired plant.

Stopping Fuel Waste

Beginning at the grates upon which the fuel bed rests, see that the air spaces are properly proportioned to avoid loss of combustible material into the ash pit. This will depend on the kind of coal used. Study the fuel with this point in mind. Five per cent. is not an unusual loss from this cause.

The amount of grate surface is important, as it determines the rate of consumption. Ratios of grate area to boiler heating surface will vary from 1:35 to 1:60, depending on the characteristics of the coal and whether hand fired or stoker fired. For power purposes in hand-fired plants do not permit the rate of combustion to fall below 15 pounds of coal per square foot of grate surface per hour, or go above 28 pounds with bituminous coal. With stokers the rate may be as high as the design of plant and the draft will permit. With the fine-steam sizes of anthracite the rate of comparison should not be less than 10 pounds.

With settings tight to prevent infiltration of air, heating surface clean, radiation losses reduced by proper covering, piping and steam mains lagged, engine valves tight and properly set, all condensation returned to the feedwater heater a good start will have been made in fuel conservation.

Human Element Important

However, merely placing the plant in good physical condition will not suffice. Conditions change from day to day, from hour to hour, even from moment to moment. These changes must be interpreted, and the degree of intelligence with which they are interpreted marks the degree of success which will be realized in fuel saving.

A good plant poorly operated will show low efficiency, while a poor plant skillfully operated will sometimes show a relatively high efficiency. Therefore,

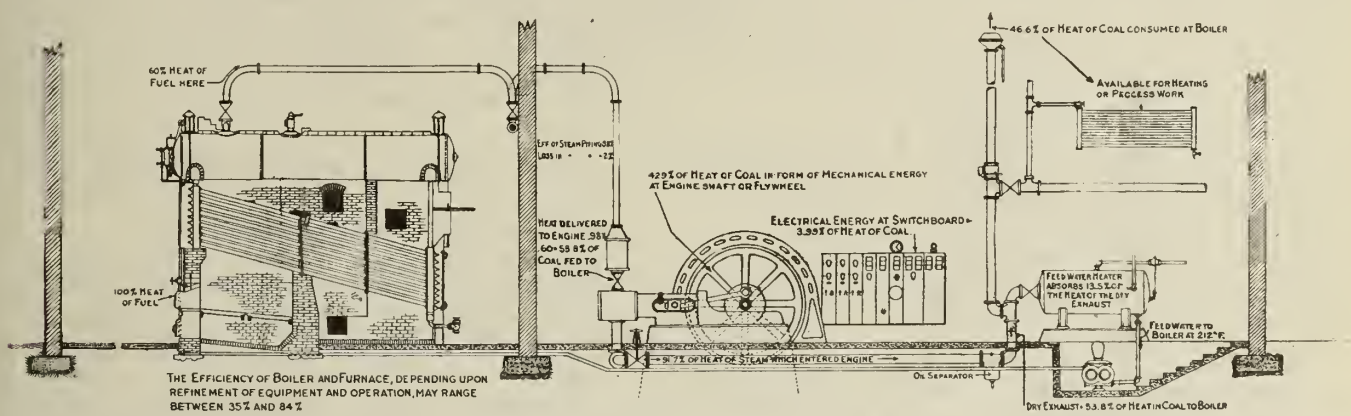
Ultimate efficiency=E×H

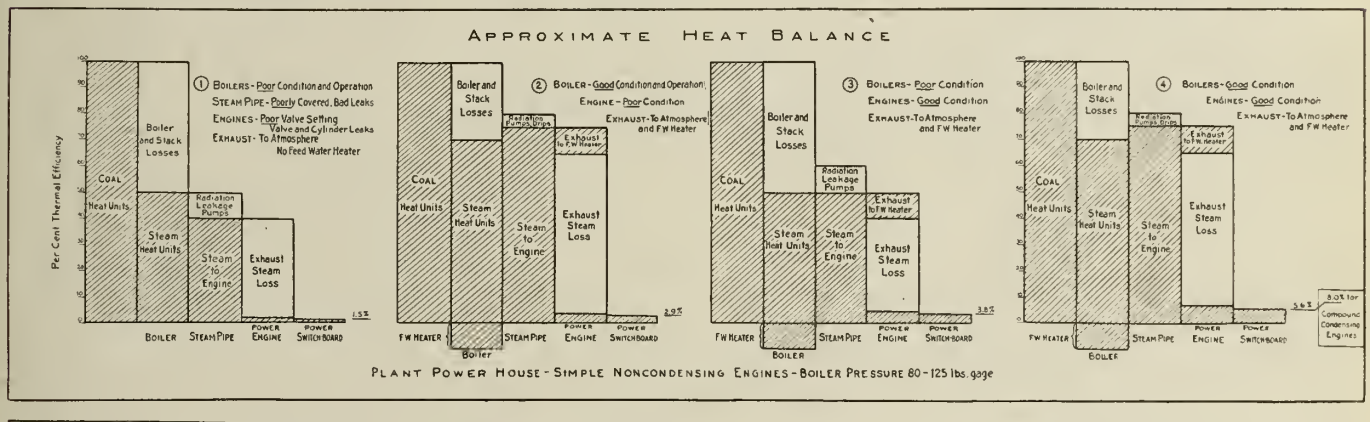
Where E=Equipment

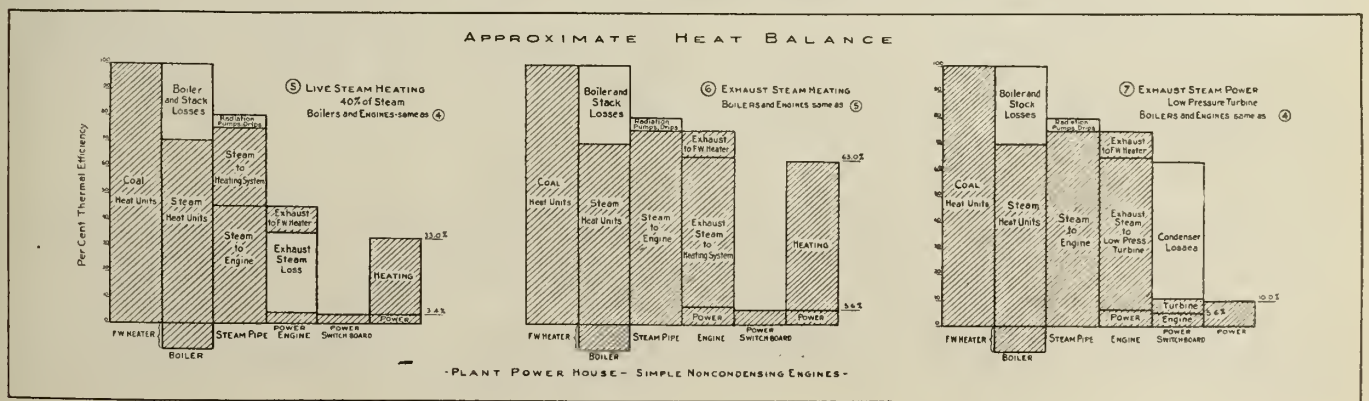
and H=Human element.

Check Operation Closely

Find out what the boilers are doing. Provide facilities for weighing the coal; for measuring the feed water; for checking up on combustion; for determining draft; for taking temperature readings at important points. To appreciate the significance of the above items it is desirable to become familiar with the literature of power-plant operation. Read Bulletin No. 1 of the United States Fuel Administration on Boiler and Furnace Testing, Technical


46.6% OF HEAT OF COAL CONSUMED AT BOILER
AVAILABLE FOR HEATING OR PROCESS WORK
60% HEAT OF FUEL HERE
42.9% OF HEAT OF COAL IN FORM OF MECHANICAL ENERGY AT ENGINE SHAFT OR FLYWHEEL
ELECTRICAL ENERGY AT SWITCHBOARD = 3.99% OF HEAT OF COAL
HEAT DELIVERED TO ENGINE 98% 60×58.8% OF COAL FED TO BOILER
100% HEAT OF FUEL
FEED WATER HEATER ABSORBS 13.5% OF THE HEAT OF THE DRY EXHAUST
FEED WATER TO BOILER AT 212°F.
91.7% OF HEAT OF STEAM WHICH ENTERED ENGINE
ON SEPARATOR
DRY EXHAUST = 53.8% OF HEAT IN COAL TO BOILER
THE EFFICIENCY OF BOILER AND FURNACE, DEPENDING UPON REFINEMENT OF EQUIPMENT AND OPERATION, MAY RANGE BETWEEN 35% AND 84%


APPROXIMATE HEAT BALANCE
Per Cent Thermal Efficiency
① BOILERS - Poor Condition and Operation
STEAM PIPE - Poorly Covered, Bad Leaks
ENGINES - Poor Valve Setting, Valve and Cylinder Leaks
EXHAUST - To Atmosphere
No Feed Water Heater
② BOILER - Good Condition and Operation
ENGINE - Poor Condition
EXHAUST - To Atmosphere and F.W. Heater
③ BOILERS - Poor Condition
ENGINES - Good Condition
EXHAUST - To Atmosphere and F.W. Heater
④ BOILERS - Good Condition
ENGINES - Good Condition
EXHAUST - To Atmosphere and F.W. Heater
Coal Heat Units
Boiler and Stack Losses
Steam Heat Units
Radiation Leakage Pumps
Steam to Engine
Exhaust Steam Loss
Exhaust to F.W. Heater
Boiler
Steam Pipe
Power Engine
Power Switchboard
F.W. Heater
8.0% for Compound Condensing Engines
PLANT POWER HOUSE - SIMPLE NONCONDENSING ENGINES - BOILER PRESSURE 80-125 lbs. gage



Paper No. 80, and various other publications of the Bureau of Mines. In small and moderate sized plants, hand fired, a boiler efficiency of 60 and 70 can be expected, while in medium-sized stoker-fired plants 70 to 75 per cent. should be realized. In any given plant determine what efficiency should be expected, considering load and equipment, and keep the plant up to mark set.

Principal Losses

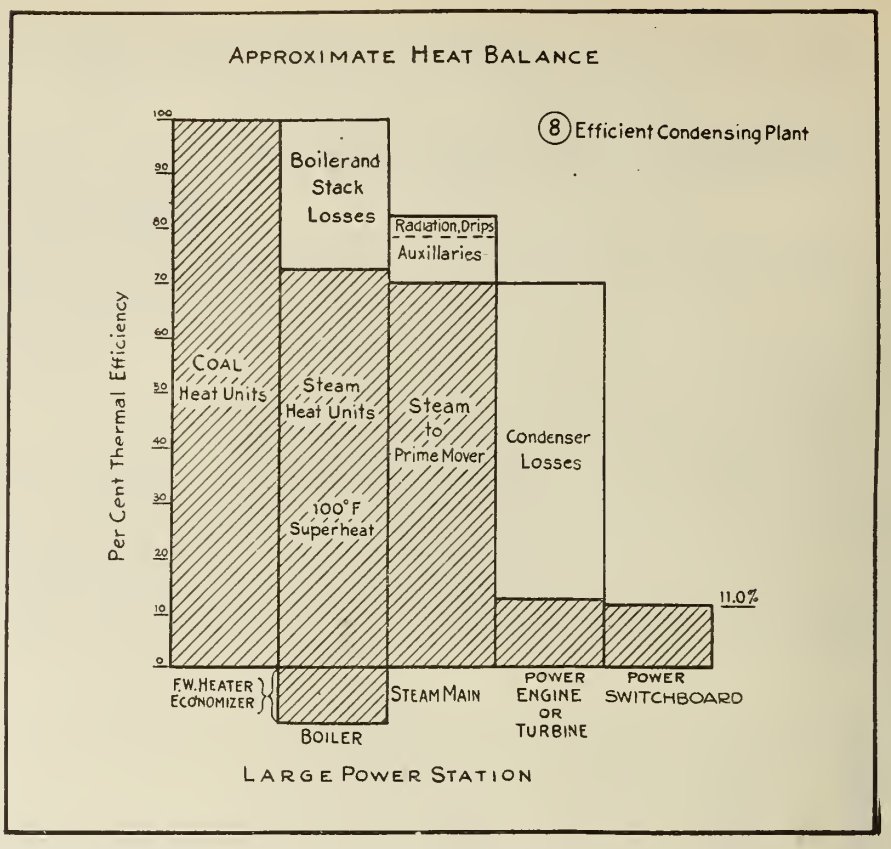
The chief losses in boiler-plant operation are:

1. Cause, dirty boiler, loss up to 25 per cent., remedy, clean boiler. 2. Leaky setting, loss up to 15 per cent., remedy, tight setting. 3. Poor firing, loss up to 40 per cent., remedy, good firing.

1. A boiler may be dirty on the inside or outside or both. Dirt on the inside is due to scale formation and can becorrected by cleaning the boiler and then giving consideration to the character of the feed water and its proper treatment. See Engineering Bulletin No. 3 of United States Fuel Administration.

Outside cleaning must receive careful attention. A slight accumulation of soot deposited in a few hours' run will result in a great loss of efficiency. Someone must be delegated to follow up this matter of soot and see that the cleaning is done thoroughly, frequently and regularly.

DIAGRAM B (c)



2. Air leaks reduce efficiency. The ordinary brickwork setting develops cracks and crevices which allow a considerable amount of air to enter the setting, lowering the temperature of the gases of combustion. The porous character of the brick itself is such that an appreciable leakage takes place through the walls.

The remedy is to point up the brickwork with plastic fireproof mixture and paint or cover the setting with a coat of air-tight material.

3. Bad firing includes allowing holes to develop in fuel bed; carrying an uneven fire; carrying too thin a fire; carrying too thick a fire; stirring fire, thus forming clinkers; and improper manipulation of dampers. It is here that the human equation becomes of most importance. Attention concentrated on what takes place from day to day in front of the boilers will pay greater returns for the time spent than in any other part of the plant.

Power Plant Records

The importance of keeping a systematic record of operations can not be overestimated. In this way affairs in the power plant are lifted from the realm of guesswork to certainty. While the system adopted for the ordinary plant may be very simple, the records should be arranged for convenient reference so that comparisons of results with past performance may be made. Thus it is possible to note the effect of changes in equipment or methods and improvements in economy or the reverse may be at once detected.

Engine Room

After the steam has been delivered to the engine, care should be taken to see that it is utilized to best advantage. Where all the steam is needed, the economy or rate of the engine itself is not of particular consequence; that is, a simple slide-valve engine using steam at the rate of 40 or 50 pounds per horsepower may be the most desirable type to use. This all depends on circumstances. As the demand for exhaust steam decreases, the importance of economy in the engine increases. Should there be periods during which all of the exhaust is not used, the maximum economy of the engine during these periods is of utmost importance. At such times the most economical generating unit should be selected and one of a size that will be economically loaded with the amount of power developed.

Use of Exhaust Principal Factor

A portion of the exhaust should be used for heating the feed water to the highest temperature practicable; not less than 200° in any event.

Exhaust mains should be pitched in the direction of flow, drained and trapped, and the condensation returned to the heater. Use no live steam where the work can be done with exhaust. To get the most efficient transfer of heat the radiating surface of coils and other heating elements should be properly disposed to promote circulation of the heat-absorbing medium, whether air, water, or other liquids. Large increase in efficiency or capacity can sometimes be made in old systems by a little attention to this feature.

In the case of stills, evaporators, or triple effects in which deposits of suspended or residue matter is liable to form, periodical cleaning of the coils is essential.

Venting radiators and steam lines of air should receive careful attention. See Engineering Bulletin, No. 6, on Saving Fuel in Heating Systems. For large systems vacuum returns are recommended. Direct radiation should be checked up with special respect to location in order that heat loss through exposed walls and windows shall be taken care of efficiently.

A study of the accompanying heat balance diagram will serve to indicate the small portion of the heat developed by the fuel which is used in generating power.

Do not, therefore, assume that the steam after passing through the engine is a waste product. It will represent a large percentage of the heat delivered by the boiler. Save it wherever possible. It is the principal product of the plant. The power is the by-product.

A DETROIT man has quit the pulpit because the world does not want the gospel as he wants to preach it. The world has been preached at until it's black in the face, and what it wants is some church members who will measure up to the preaching that is done to them.

* * *

A SUGAR refinery in Montreal hastens to deny that it has any labor trouble. Conditions are as sweet as the product of the factory.

Much Needed Plumbing May Be Installed Under Local Improvement Plan

Guelph City Council Holds Conference With Plumbers to Discuss Ways and Means—Further Information is Being Secured

AN important conference was held at Gueiph, Ont., between the city officials and the local plumbers to try and work out details of a plan by which a large amount of much-needed plumbing work may be done on the local improvement plan. Mayor Carter, who is behind the move, has been investigating conditions and is anxious that every home in the city which can be connected with the sewers should be. Many homes where sanitary accommodations are badly needed are without them in Guelph, owing, it is stated, to the cost of installation. With a view of solving this problem and making for a general betterment of civic health, Mayor Carter called the conference.

The matter was gone into fully, and there is every hope that a plan will be formulated by which the work that is required can be proceeded with and arrangements for payment spread over a term of years. Just what can be done in arranging this financial matter could not be discussed at the meeting as no one was prepared to give definite figures. Because of this it was decided to postpone the meeting until this and other data can be secured.

The city officials at Guelph realize the importance from a health standpoint of providing every home with proper sanitary equipment. Guelph so far has been free from serious outbreaks of disease, and one way of keeping it so, the officials believe, is to provide modern plumbing as far as possible in every home.

The move made in Guelph is being watched with considerable interest, it is stated, by some other communities, and if arrangements can be made for doing the work under the local improvement plan it is likely that this method may be adopted by other places.

Proper Sanitation First Aid to Housing in Town Planning

Superintendent of Hospitals in Montreal Discusses Importance to Health of Proper Housing Conditions—Infant Mortality Largely Due to Insanitary Homes

MR. J. E. LABERGE, Superintendent of Hospitals in Montreal, in a paper read before the Canadian Medical Assoc., at its annual meeting in Quebec, made a number of suggestions of keen interest to sanitary and heating engineers. In discussing the importance of proper town planning he emphasized the need of proper living conditions, especially in every home. Dr. Laberge declared that sanitary records should be kept showing the state of every house generally, and that this would go a long way in helping the authorities in their fight to stamp out disease. A thorough inspection of houses by the civic authorities, he said, would be a splendid plan for reducing the tremendous infant mortality. It was a well-known fact that where the death rate among infants was high, unsanitary conditions were usually to be found. Public instruction on the importance of living cleanly was urged by him.

Make Cities Healthy

It was pointed out by Dr. Laberge that the main object of town planning was to make cities more beautiful, healthy, and suitable to live in. There was no more important problem connected with town planning than the housing question. No town could possibly boast of model hygienic conditions if slums were permitted to exist.

Apart from the question of slums, there was in all great cities large numbers of dwellings which were not healthy; the cause was due, not so much to their construction as to the ignorance of tenants in matters pertaining to hygiene. Public education was badly needed here.

Need for Reform

"The question of housing," declared Dr. Laberge, "should be embraced in all social reform works; that is to say, each and every one should co-operate to assure healthy habitations. Persons espousing this laudable cause will not be sufficiently prepared for the struggle, if governments, whether federal, provincial or municipal, do not lend their assistance. It is not simply a legislative intervention that is necessary, financial aid is of prime importance.

"Education is also an important factor, because, in order to permanently change the condition of dwellings, the habits and morals of the people must be changed; they must be inculcated with the desire for cleanliness, and finally, they must be made to appreciate the benefits of sunlight and pure air to preserve human health."

Should Keep Records

After contending that all town planning ought to embrace measures pertaining to plenty of open spaces, parks, etc., Dr. Laberge declared that sanitary records should be kept showing the state of houses generally. This would result in the health authorities having wonderful control. Legislation ought to be enacted, making it more easy for municipalities to purchase grounds, etc., on which model houses could be erected. "In addition to this there should be by-laws making it incumbent on proprietors to keep their houses in up-to-date sanitary state. In the end this would be found more profitable than permitting them to decay for lack of proper care. But the most important phase of the question would be the marked improvement in human health."

Need Strict Laws

There should be strict laws compelling tenants to keep their premises in good order. A man did not make a good citizen because he merely paid his rent. He owed it to the public at large to see that both his house, yard, lane, etc., complied with the health laws. When these principles of health were outraged both the tenant and the landlord ought to be held responsible. One of the most important moves, to do away with slums, would be the passing of inexorable by-laws and legislative laws making it a serious offence when landlords rented houses that were unsanitary.

PRACTICAL METAL WORK

(Continued from page 34)

Next draw three more dotted lines from 5,5 6,6 and 7,7 Fig. 2, to the intersections on joint line M N. The points where these horizontal lines cross the vertical lines 1, 2, 3, 4, etc., Fig. 2, as shown by the shaded portion, is the pattern of the hole required for the branch.

Now draw lines upwards from 1, 2, 3, in line with the stretchout shown in Fig. 3 from the various intersections on joint L M N in the elevation Fig. 1, until all the stretchout lines have been crossed in Fig. 3.

Now draw the curved lines from N to M, M to F, F to M and M to N, crossing each point already crossed as shown at 1,2,3,4 5,6,7, etc. The outline MFM. N N O O is the pattern for the branch piece required.

An allowance must be made for seams and joints, these to be determined by the person making the pipe. If a riveted joint, only one width of caps would be necessary, but if a locked seam is required it would be necessary to allow three times the width of the lock.

News from Here and There

CONTRIBUTIONS OF NEWS GLADLY ACCEPTED

The plumbing contract for the Molsons Bank at Iroquois, Ont., has been secured by Hickey and Aubut, Montreal.

George W. Reed and Co., Montreal, have secured a roofing contract for a $35,000 building for J. McGill, Dorval, Quebec.

Felix Gareau, plumber, Montreal is dead. Mr. Gareau was but 34 years of age. His remains were conveyed to Cote des Neiges cemetery for interment.

W. J. McGuire and Co., Limited, Montreal, has secured the plumbing and heating contract in the new Bell Telephone Building on Ontario street. The cost is said to be $80,000.

John Watson, Montreal, is taking a short vacation. Mr. Watson told SANITARY ENGINEER (confidentially) that he knows a good fishing ground, and that it just requires "angler's patience" to get them. As practical proof he produced a snap-shot showing 50 beauties on a string which he and his partner got the last time. Here's luck again.

Telles Latourelle, president Montreal Master Plumbers' Association, spent a short vacation and went to Niagara Falls by boat, accompanied by Mrs. Latourelle and family. Mr. Latourelle reported his pleasure at again being home, the heat being very great while holidaying. Montreal and its environs looks good to its citizens every time they return.

BUSINESS CHANGES

P. Lamay & Co., plumbers, of Montreal, have dissolved, and Jos. Lepage is continuing under the same style.

CONVENTION IN CLEVELAND

The convention of the American Society of Sanitary Engineering will be held this year at Hotel Winton, Cleveland, Ohio, on September 15, 16 and 17.

TENDERS CALLED FOR SCHOOLS

L. C. Charlesworth, Deputy Minister of Public Works, is calling for tenders up to noon July 24 for general contracting, electric wiring and plumbing, heating and ventilation, for the erection of farm buildings and workshops at the Agricultural schools Reymond, Youngstown and Gleichen.

OBITUARIES

Harry J. O'Neil, manager of the St. John, N.B., branch of the James Robertson Co., Ltd., met a tragic death in Boston harbor last week. While on a trip to New York he had stopped at Boston and was on a passenger steamer in the harbor when the arrival of a transport in port sent all the passengers rushing to one side of the vessel to witness the return of the troops. He was crowded overboard and was drowned before help could reach him. He had occupied the post of manager only a year, succeeding the late Jone Keefe after twenty-one years' service with the company. E. J. Terry, who has been a member of the St. John staff for several years, has been appointed manager in place of Mr. O'Neil.

MAY APPOINT INSPECTOR

The Board of Health at London, Ont., has recommended James C. Young for the position of city plumbing inspector, and the matter is now being considered by the council. It is expected that the appointment will be made, although there may be some opposition. In the past the appointment of a plumbing inspector has been opposed by some of the property owners, who declared it was an unnecessary expense, and failed to take into consideration the importance of the work from a civic health standpoint.

HAMILTON OUTING AT WABASSO PARK

The annual outing of the Master Plumbers of Hamilton, held at Wabasso Park, proved a most enjoyable affair in spite of the efforts of the weather man to cut the fun short. In addition to the party of Hamiltonians, with their wives and families, fifty-five of those in the trade motored over from Toronto and took part in the doings. Gordon Stewart of Hamilton was master of ceremonies, and both he and W. J. Walker were kept busy welcoming everybody and seeing that everybody got acquainted. A feature of the programme was a baseball game between Toronto and Hamilton. This battle has been in prospect for a long time, and both nines have been getting ready for it. It turned out to be a real game at that, and a glance at the score will indicate that it was some swatfest. Both teams relied upon heat hitting to win, and they clouted the ball all over the lot. It was a close game all the way through, and the score was 15 to 14 in favor of Toronto. A. Rogers, who officiated as umpire, gave every satisfaction. The Hamilton nine are looking for a return game, when they hope to even matters up. Before the programme could be completed a heavy shower of rain came on and lasted so long that the outing had to be cut short. In spite of this, however, everyone had an excellent time.

DON'T FORGET THE BIG PICNIC ON JULY 17

The annual picnic of the Toronto Society of Domestic Sanitary and Heating Engineers will be held at Island Park on Thursday next and there is every indication that it will be of the real old-time, get-together, everybody-have-a-good-time variety. Harry Farthing, who is chairman of the committee which has arranged the program, promises that it will be a real day and one that no one should miss. "The more the merrier," says Mr. Farthing. "We should have at least 1,000 of the boys with their wives and friends out, and we will see to it that they all have a good time."

CANADIAN GENERAL ELECTRIC CO., LTD.

"Fixtures, glassware and appliances for farm lighting plants," is the title of an attractively printed catalogue issued by the Canadian General Electric Co., Ltd., of Toronto. The pages are eight by ten and a half inches, and there are numerous illustrations showing the application of various electric devices to farm work. Among other lines listed besides the fixtures and glassware are portable electric sewing machines, heating and cooking appliances, motors for household work, vacuum cleaners, electric washers, wiring devices and supplies. Copies of the catalogue will be sent to readers of SANITARY ENGINEER upon request.

TIN PLATE PURCHASES INCREASING

Canada is now one of the largest buyers of tin plate, terne plate and taggers tin that the United States has. Figures available for the latest monthly period show that in that time Canada purchased

H. A. MAGUIRE

For the past six months connected with the Toronto office of the MacLean Publishing Company, has been transferred to the Chicago office of the company and will have charge of work on two of the MacLean papers, Hardware and Metal and Sanitary Engineer, in the Chicago territory. Before joining the MacLean Publishing Company staff, Mr. Maguire spent 11 years in the hardware business. For several years he was on the traveling staff of D. H. Howden & Co., wholesale hardware, London, Ont.

9,496,288 pounds, valued at $709,301. The United States' next largest customer for tin was the Argentine, which took tin valued at $425,419.

BRITISH GAS STOVE MAKERS COMBINE

With the idea of strengthening their position in holding home markets and in going after export trade, British gas stove makers have combined under the name of Radiation, Limited. The new company has a capital of $13,750,000, and includes the businesses of John Wright & Eagle Range Co., Ltd. of Birmingham; Richmond Gas Stove and Meter Co., Ltd. of Warrington, and the Davis Gas Stove Co. of Luton. The head office will be at Birmingham.

TRADE WITH DANISH INTERESTS POSSIBLE

Information has been received from the Foreign Office by the Board of Trade that the Danish Government have now given a general guarantee, which has been accepted by the associated Governments, that goods imported into that country will not be re-exported to enemy countries. They announce, therefore, that except for goods on lists A or B, all restrictions on export to Denmark, whether by freight or by parcel post have been removed.

Exporters should, however, satisfy themselves that the goods are not subject to any Danish import prohibition.

Applications for licenses to export goods on lists A or B should continue to be made to the Export License Department (4, Central Buildings, Westminster, S.W.1.), but no certificates from the Danish associations need be produced.

RAISING BLOCKADE ON GERMANY

By unanimous resolution of the Allied Council in Paris it has been agreed that the new peace treaty shall not be effective until the deposit of ratifications by the signatory powers. At the same time it is announced that trade with Germany will be permitted to begin as soon as Germany herself has ratified. The announcement given out is as follows:

"The Council of the principal Allied and Associated Powers has adopted the following resolutions in regard to the raising of the blockade on Germany. The Superior Blockade Council is instructed to base its arrangements for rescinding restrictions upon trade with Germany on the assumption that the Allied and Associated Powers will not wait to raise the blockade until the completion of the ratification as provided for at the end of the treaty of peace with Germany, but that it is to be raised immediately on the receipt of information that the treaty of peace has been ratified by Germany."

WIRE COMPANY ELECTS OFFICERS

At the organization meeting of the Clinton-Wright Wire Company, the merger of three Massachusetts manufacturers of wire products and specialties, George M. Wright was elected chairman of the board, Evan F. Jones treasurer, John A. Denholm and George F. Wright vice-presidents. The board of directors is composed of the officers mentioned and Harry Bronner, president of the Missouri Pacific Railroad; Frank A. Drury, president of the Merchants National Bank of Worcester; Paul B. Morgan, president of the Morgan Construction Company; Charles F. Fairbanks, formerly president of the Clinton Wire Cloth Company; Richard B. Young, E. H. Rollins & Sons, and George F. Naphen, of Liggett & Drexel.

BRITISH ALUMINUM CO.

"The Casting of Aluminum" is the title of an interesting booklet published by the British Aluminum Co., Ltd., of London, Eng., Canadian branch, 265 Adelaide Street W., Toronto. It deals at length with the subject of aluminum alloys, their development and uses. There are sections which deal with "Mixing Alloys," "Moulding," and "Melting," in which a great deal of valuable information is given. Copies of the booklet may be obtained upon request by readers of SANITARY ENGINEER who are interested.

Western Canada Industrial Congress

Industrial Matters and Questions Pertaining to Development of the Western Markets Will be Discussed

WESTERN Canada is to have an industrial congress from August 11 to 16, to which manufacturers and industrial leaders of the continent, as well as those of the United Kingdom, are being invited. The purpose is educational to a large extent along industrial lines, though one of the intentions is to promote and increase the friendly relationships between the United States and Canada and to create a greater unity as between Eastern and Western Canada.

Discuss Markets

Subjects up for discussion are Western markets, Western industry, Pacific trade and transportation routes, Oriental commerce, the future alignment as between East and West in so far as manufacturing is concerned, and the great question of building up the Pacific regions and the adjacent inland territory.

The congress is assuming international importance, and thousands of American manufacturers as well as those of the eastern part of Canada as well as England will be on hand. The discussions are to be made by men foremost in industry and science as applied to industry on this continent.

The Speakers

Among those who will speak are Sir Robert Borden, Prime Minister of Canada; Henry Ford; Harold McCormick, head of the International Harvester Co.; E. W. Beatty, president of the Canadian Pacific Railway; Robert Dollar, head of the Dollar Steamship Lines, and many others.

All interested in industrial development in the West or in Western markets are invited to attend. The movement is accompanied by a propaganda to the effect that Eastern factories which sell to Western markets in bulk should build branches in the West.

The Itinerary

The congress dates are August 13 and 14 at Calgary, Alta., though a trip through the territory and including other Western cities will commence at Medicine Hat, Alta., August 11, and conclude at Edmonton, the capital city, where the Premier and Government members will entertain the guests. A side trip will be made to Canadian Rocky Mountain resorts.

Congress headquarters are open at the Palliser Hotel, Calgary.

Heating and Ventilating

RADIATORS

Eighth Article of Series Prepared for Readers of "Sanitary Engineer" by N. A. Kearns

Editor's Note.—This article is the eighth of a series prepared especially for the readers of SANITARY ENGINEER, covering heating and engineering practice reduced to its simplest terms. Readers will find this article on the "Radiators" a most interesting and illuminative one. The first article of the series appeared in the April 1 issue. Descriptions of installations made in different classes of buildings will be given, together with the method used in making the designs for these installations. It is not our purpose to give complicated formulas, but rather to present the simple rules that have been based on these formulas, in such a way that the reader will be enabled to design a heating and ventilating system without having to refer to the data given in engineers' hand-books. The author of these articles, Mr. N. A. Kearns, has designed heating and ventilating equipment for all classes of buildings in practically every province of the Dominion. Some of the buildings were such that the heating and ventilating equipment had to be installed under the most adverse conditions, whereas in other buildings the design for the heating and ventilating equipment was incorporated in the constructional drawings. The ninth article of the series will appear in the next issue.

TEMPERATURE is transferred from radiating surfaces to the surroundings by radiation, by convection and by conduction.

Radiation occurs when the heat is transmitted from the radiator by the direct action of the heat rays. An example of this is surfaces of an article of furniture exposed to the radiator surface becoming intensely hot, even when the air between the radiator and the furniture may be quite cold.

There is really very little radiant heat used in warming rooms, and while we term the heaters "radiators," the name is not really expressive of the function of the fixture. A better term might be one expressive of the purpose of the so-called radiator as an apparatus for delivering heat by means of convection.

Convection is a term that is not as readily understood as the term circulation, and while convection might be considered as a sort of circulation, it must not be taken as meaning exactly the same thing. When air moves in a room the movement is called circulation. For an instance we will consider that the movement of the air is due to a difference of temperature condition and that there is a hot radiator set so that it is continually adding heat to the air. The heat is added to the air by direct contact of some of the air particles with the heated surface of the radiator. If some means could be devised to keep the air currents stationary little heat would escape from the radiators.

As the most of the heat transference is due to convection, and as convection is greatly accelerated by a brisk movement of the air currents, provision for a free air movement over the surface is desirable.

When radiating surfaces are much less than required to heat the room, an increased measure of heating efficiency of such may be had by the use of a small electric fan used in a manner that will keep the air circulating around the radiator. As a radiator becomes warm an accumulation of air clings to the metal and this accumulation grows thicker and thicker as the surroundings become warmer, or as the temperature of the radiator itself rises.

If a radiator is constructed so that there is a great deal of surface exposed to a uniform body of air the heat transference is much more rapid than when a like amount of surface is arranged in such a manner that some of the air passing over part of the surface has already been heated by other portions of the radiator. It is for this reason that a low radiator of a narrow type with ample air passages is much more efficient than a higher radiator with smaller air passages.

Very often the estimate for heating a building is based on the high efficiency of low radiators of the hospital type, and when the installation is made failure is experienced because of the use of a type of radiator different to that on which the estimate was made.

Radiators should not be crowded close to the walls and they should always be set so that there will be a free circulation of air around them. Do not put radiators under window seats and expect that you are going to get the best service from them. If you have to place radiators under window seats, try and arrange the details so that the radiators will have ample space for air passage, and then arrange for a positive supply of air returning from the room to the bottom surfaces of the radiator, and a free escape of air from the top.

Air will not take up heat from a radiator in anything like the same volume as the heat is brought to the radiator by the heating medium of steam or of water. Now, iron or steel is a good conductor of heat or cold, so some engineers have made attempts to increase the efficiency of radiating surfaces by adding surfaces to the radiator by the use of extended metal desks or rods. These extended surfaces become warmed through the conduction of heat from the primary surfaces of the radiator to which they are connected, and where such surfaces are arranged, so as not to interfere with a free flow of air, they are of the greatest value. This type of radiator is used to a greater extent in Europe than in America.

Reference has been made to the fact that radiators give up some heat to their surroundings by conduction. The amount of heat transmitted in this way is so very little in the ordinary practice of heating that we can practically ignore it in making our calculations or in laying out the design.

The great principle to work to in choosing our heating surfaces, and in in-

stalling them is an easy air circulation.

The efficiency of radiators in B.T.U. is figured for steam by the condensing power of their surfaces. Thus: One pound of water condensed from steam at 212 degrees gives up 966 B.T.U. If a radiator, say, of 24 sq. ft. is set in still air at a temperature of 70 degrees Fahr. and condenses 6 lbs. of water from steam, as above, in one hour's time, we can base the estimate of the radiator efficiency thus: 6 ibs. of water is equivalent in B.T.U.'s to 6 x 966 B.T.U.'s = 5,796 B.T.U., and 5,796 B.T.U. divided by the 24 sq. ft. of the radiating surfaces gives us 241 B.T.U. per sq. ft. per hr.

Under different conditions more or less water might be condensed in the radiator within the same length of time. If the room had been colder than 70 degrees the condensation would have been more rapid, and on the other hand had the room been warmer we would have had a corresponding low rate of condensation. If there was a brisk air movement over the heating surfaces the condensation would have increased. For example. if the air was traveling over the radiator at a temperature of zero and a velocity of 1,000 feet a minute, the condensation would have been 2.7 lbs. per sq. ft. of water with a corresponding heat emission of 2,488 B.T.U.

If the air is dry the condensation will be a great deal less than if the air is moist. Then the material of which the radiator is made will also have a bearing on its efficiency, wrought iron being 70 per cent. less value than cast iron.

The form of the radiator has a much greater bearing on its heat transmitting value than has its material, and wherever possible the engineer should use the lowest radiators possible with the greatest free airway

For quite a long while engineers here in Canada have been using an average efficiency of 255 B.T.U. per hour for cast iron radiation and have found that with very few exceptions that this was a safe constant to use. The American Society of Mechanical Engineers recommends a constant of 244 B.T.U. If the reader prefers to use the A.S.M.E. figures he should be careful to figure on a boiler based on the same estimate. This warning is given, as lacking a caution of this kind one might allow too great a margin in estimating the boiler capacity, and as a result instal a boiler much too large. The radiators most in general favored on this continent are those made of cast iron, in various styles and patterns. Although there have been special occasions where the owners of very valuable residences have had the radiators cast in patterns harmonizing with the decorations of the rooms in which they are situated, it is, as a rule, desirable to use radiators of a plain inconspicuous type.

In some of the older houses in New York State there may be found radiators made up of steel or wrought iron plates. These radiators are usually set in the walls and grained to imitate wood panels. When one realized that it is not a very large room that 48 square feet of hot water heating surface will heat, and that a radiator of that size requires space equivalent to a 6 ft. x 8 ft. panel it becomes easy to understand why there are not a great many installations of that kind found throughout the country.

There are a few of the older buildings in Toronto heated by radiators running around the rooms in the form of pipe coils set in recesses at the base board levels. One thing that impresses the visitor to Ottawa is the amount of 3 in. single pipe radiators used there. Of course, they are principally found in the older buildings, but one cannot help but be struck with the appearance of the same when comparing them with the pipe and box coil installations made elsewhere in Canada at about the same date.

When called in to make a survey of an existing heating plant, the reader, no doubt, has often noticed a form of radiator made up of tubes screwed into a base. The radiator is, as a rule, made up of 1 in. tubes 3 feet long, so that in estimating the areas of such we can usually consider that each tube is equivalent to 1 square foot of heating surface.

There are several types of pressed metal radiators on the market. The claim is made for them, by their advocates, that they, being lighter than cast iron, can be set in positions impossible for the setting of the heavy cast iron type. That the thin walls of the radiator permit a great free airway between the sections and that they are easy to instal.

Cast iron radiators are so well-known to the trade that rarely has an experienced journeyman occasion to refer to a catalogue for the equivalent area of any type or height, and, as a rule, these men are so familiar with cast iron radiators that they frequently can "rough in" from the figures they carry in their heads.

To the man that has difficulty in remembering the areas of certain types of radiators, we are giving an example as a suggestive tip, and he will find that when he can carry in memory the area of a certain style of radiator he will find it very easy to use that style as a standard to figure the capacity of other radiators by. We will, as an example, refer to the ordinary two column cast iron radiator. We do not suppose that there is one reader of this article who does not know that a radiator 38 in. high of this type has an area of 4 sq. ft. per section, but we would ask the reader if he ever has noticed that the 38 in. could be very easily read as 3.8 sq. ft., which is nearer the actual area of that radiator. And if the reader says he has, no doubt he has also noticed that a 32 in. radiator contains 3.2 square feet; a 30 inch radiator 3.0 square feet; a 26 inch radiator 2.6 square feet; a 23 inch radiator 2.3 sq. ft., and a 20 in. radiator just 2 sq. ft. Four loop radiators have an area just twice that of those of two loops. These figures are close enough for the reader to set a basis for radiators of other types.

Cast iron radiator sections are connected together by means of either screw or push nipples. Push nipples are made with a slight taper so as to fit into the machined tapered openings of each section. Screw nipples are used in radiators when the openings are tapped for this purpose, and they are built by screwing up one section at a time.

Hot water radiators are nipple-connected top and bottom. This type of radiator is also often used for vapor-vacuum and vacuum steam systems of heating.

Ordinary steam radiators are only fitted with nipples at the bottom of the sections. Radiators can be assembled so that a small chamber with doors may be set between some of the sections for the purpose of providing a plate-warming closet in dining-room radiators.

Radiators can be built to fit almost any circumstance. They can be set to follow the lines of a bay or bowed window; they can be run along a stairway, following the lines of the treads and risers, or they can be set in a corner or in a circle as circumstances may demand.

A type of radiator much in favor where floor area is at a premium, or where the unbroken wall surface is long enough to permit the installation of such is the radiator made up of "wall sections." These radiators are a little more than 3 in. thick at the hub and are made in 5, 7, 6, 7, 9 square foot sections.

Direct, indirect or semi-direct radiators are made up the same as the direct pattern, differing only in that they are equipped with special bases with damper controlled openings, permitting air from outdoors to pass over the heating surfaces for the purpose of ventilation.

Indirect radiators are radiators that are not set up in the rooms to be heated. These radiators are set up in a chamber at some suitable location, and there they warm the air that is used in heating or ventilating the room which they serve. Indirect radiators are usually of the extended surface type.

Pipe coils are frequently used as radiators in factories, etc., and when figuring on such surfaces a greater heat transmitting value per sq. ft. may be allowed than when figuring for cast iron radiation. The proportion is about as follows: cast iron rads., 250 B.T.U.; pipe coils, 300 B.T.U.

TO OPEN SALES OFFICE IN TORONTO

Galt Brass Co., Ltd., Galt, Ont., have established a general sales office at 67 Adelaide Street East, Toronto.

Ventilating the Modern School

Seventh Article of Series Written Especially For "Sanitary Engineer" by N. A. Kearns—First Article of Series Appeared in April 1 Issue

THE ventilating system of a school, however well designed or installed, cannot be considered as perfect if some regard has not been paid to the thorough ventilating of that portion of the building generally termed the basement.

At one time it was considered quite the thing to leave the sanitary and heating arrangements of a school as the last thing for the designer's attention, and as a result the plans were pretty well advanced before some hole was found under the building where the heating apparatus could be placed and a few modern sanitary appliances fixed.

You will remember the building with its nice new maple floors and its nice clean sanitary trim at about the time you first saw it. Well, suppose you also remember the basement and how dark it was in certain corners—the narrow winding stair and the malodorous "sanitaries" that were set back against the porous brick fresh air flues. It was a pretty good school building above the basement, and members of the school board and also their architect were mighty proud of what they had erected. Only a few months slipped by and then an epidemic of sickness swept through the school. The "old fogeys" shook their hoary heads and said, "See what these new-fangled things have brought us to, better by far had we heated the school with a stove and had the lavatories out in the backyard." For once the "old fogeys" were right. The building of the school with a dark, low basement was a mistake. So the next school that the board were called upon to build they built with a good high basement and with the windows well out of the ground. They took good care to have a dry basement and to get such a basement cost them a lot of money. They had the walls below the grade level thoroughly waterproofed, and by a system of field tiles kept the ground water from gathering around the walls. Finally they found that it was costing so much money to excavate for a basement that they built their new schools entirely out of the ground.

Some of their later schools might well have been built with a semi-basement as the sites were of a nature to warrant that system of construction, but no, they had decided on a policy of "no basements" and they were as stubborn in that policy as they were stupid when they blasted out ten feet or more of rock and hard pan in the days of the basement building.

We started out to write this article as one of the series regarding the ventilation of schools, but when we came to the part of the subject having to do with the lower regions of the school building we could not but drift into thoughts of that great question of sanitary equipment and a consideration of the amount of experiment and time that has been spent in making the modern school building what it is to-day—perhaps the greatest example of sanitary science in the world.

No ventilating engineer is worthy of the name if he does not see the importance of abolishing from the school building every contributory cause of ill-health. It is not simply the money or the prestige gained through vigorously fighting for the best, and only the best equipment that will bring him the greatest degree of satisfaction, it is the consciousness of knowing that he has stood for what is simply a question of right and not of expediency.

One of the things that sanitarians had first to fight for was the installation of the individual water-flushed closet to take the place of the malodorous range. Then, after the individual type was installed it was found that very frequently the children neglected to flush them, and it became necessary to provide some kind of an automatic flushing system. Automatic flushing at intervals was tried out and found not to be of much value unless it was practically continuous. Continuous flushing is very wasteful, and yet it is astonishing how many schools all over the country still use such a system. The writer has had occasion to visit certain public schools during every hour of the day and night, and it has often been his experience to hear the automatic flushing of these fixtures going on at short, regular intervals all night long. True, the janitor could have turned the water off, but it was a case of a little extra work, and so the water was allowed to run.

There are many seat action closets now being installed in public schools, and should the reader be called on to make any recommendations regarding such, our advice is not to advocate the cheapest.

See that the closets are made of non-absorbent materials with good heavy walls, and a water-way of at least 2½ in. clear diameter.

The bowl should have as little fouling surface as possible, having rather a large water surface. In schools the bowls should not be more than 14 inches high. Some time later it is our purpose to take up sanitary fixtures, one by one, and describe in detail the functions of each and every part of these fixtures so that our readers can be guided in drawing up specifications for this class of work.

Naturally the reader will be interested in how these toilets should be ventilated, and when we write of the ventilating of closet stalls or rooms, we do not wish the reader to confine this with the necessity of ventilating the W.C. bowl itself above the water line; that is a subject that will be taken up at a later date when such fixtures are described in detail. The system of ventilating that we are now touching on is the direct extraction of foul air from the room.

The ventilating system of the toilets must be kept distinct from that of the rest of the building. The foul air should be drawn from the W.C. stall through vent openings set a few inches above each bowl and carried to an exhaust flue, but there are also occasions when by the use of an exhaust fan the foul air may be drawn from the stalls by way of the vents in the closet bowls.

Closets should be set up in double rows, that is, with back to back, with a working space of passage between the rows. They should be set so that light will fall along the passage in front of them. The partitions between the stalls may be of marble, slate or some other non-absorbent and non-staining material. They should be built in such a way that they will be practically vibration proof. There is nothing more annoying than to have partitions erected that will not stay in place, so be sure when you instal partitions that they are heavy enough to stand a certain amount of racking, otherwise trouble will be experienced in making the doors always fit. Partitions should be kept 12 inches from the floor at their bottoms and 6 feet above floor at their tops.

For too great a length of time, urinals, as found in schools, have been simply marble or slate slabs with galvanized iron gutters and periodic automatic flushing device that had the same bad features as the periodic automatic flushing system of water closets. Seldom are these types of fixtures properly ventilated.

Urinals of solid glazed porcelain and also of Carra glass and fire-clay are the things to recommend. Fixtures of this kind are fitted with adequate openings and are no doubt the most sanitary that can be had. The flushing of the urinals should be effected by a spray flushing device or an integral flushing rim, distributing the water evenly over the surfaces.

There are a few other items in connection with the sanitary equipment of a school that might be written here. There is the matter of showers, of floor drains, of hot water service, etc., but as these things have not any direct bearing on the matter of the purity of air we can leave them for a later article dealing with plumbing fixtures alone.

The reader must not think that we have wandered far afield from the subject of ventilating when we stop to write of plumbing systems, for these things have a great bearing on the matter, and we feel that we can close this article by calling attention again to what we wrote at the beginning when we stated that no system of ventilating, however complete, could be considered as perfect if the basement was not also thoroughly ventilated.

Salespeople of To-day and To-morrow

Some Facts on Sales and Salespeople, and on What Salesmanship Means—The Vital Points in Handling Customers

Sanitary Engineer's special report of the third lecture by FRANK STOCKDALE

THIS is another of the addresses delivered by Frank Stockdale, the noted business expert, in connection with the Saskatchewan R.M.A. Convention, as reported by the special representative of SANITARY ENGINEER.

The concluding address on "Meeting To-Day's Competition," which will appear next issue, deals with some interesting points. The flypaper stage of business is passed, is Mr. Stockdale's contention in this lecture, customers no longer light and stick. He examines the nature of the competition and points out that it is not all from the Mail Order House. The need of studying conditions and evolving new methods. Limit the stock, but give the assortment. Our competitors are winning out because they are giving thought to the business, and the remedy is obvious.

"THIS is a very important subject because the sales people are the front line forces of the retail business. They occupy the front line trenches between the counter and the shelves, and if they have not got the morale they require they will not 'go over the top.' If your store disappoints the customer he or she will be disappointed with your whole institution to a greater or less degree. We must realize that one of the most important things is to look after the front line trenches. The war has proved that no discovery during war time took the place of infantrymen who went over the top. The need was for man-power. Your store cannot battle successfully to-day with the competition it has to face unless it is equipped with the right kind of man-power, and that is the power of the salespeople behind your counters."

"It takes a lot of preparation to fit the soldier for modern battle. Modern warfare is not so far ahead of modern business. Soldiers must be put through months of training, even then they are not equipped, for years of training are required. The evolution of business is such that if you are eventually going to compete you will have to have your salespeople trained. Salespeople of to-day and to-morrow will be trained salespeople. It is not a waste of money to train salespeople, and very few are born salesmen.

The Imperative Need of Training

"If soldiers were going into battle against soldiers who were not trained they would not need to be trained, but your salespeople are in direct competition with the best in the country. The customers who come into your store are coming direct from dealings with trained salespeople in other stores, and they compare your salesmen with the trained and the best ones who have waited on them. You are being compared with the best, that is the reason the customer is particular. Some say customers are getting very particular and harder to please. Some merchants say salespeople are not as good as they used to be. I believe salespeople are better than they were, but their job is a great deal bigger because their competition with trained people is so great. You perhaps lose more customers because of the service your salespeople render than from any other two causes.

"Salesmanship is a big job. If an electrician makes a mistake he blames it on anything which is not understood generally; if the doctor makes a mistake the customer dies, and the blame is laid at the door of some unknown disease, but if the salesman makes a mistake he is the big loser."

A definition of salesmanship, given at this point, was as follows: "Salesmanship consists in acquiring a psychological ascendency over the mind of your customer."

When a Sale Happens

Mr. Stockdale stated that one merchant had remarked that he would like to know "when a sale happens." The reply from another merchant was as follows: "A sale happens in my store when a customer leaves the store after having bought more goods or better goods than he or she intended to buy. Otherwise the customer has just been 'waited on.'"

"Negative salesmanship is where the salesman does not sell as much to a customer as he or she intended to buy when entering the store," continued Mr. Stockdale. "The people who work in retail stores are divided into two classes, store waiters and salespeople.

"Clerks, waiters and bar-tenders were listed together as non-essential occupations for the purposes of the draft system in raising the United States army. While this classification is in part insulting to the retailers, yet it is unfortunately only too true, in a great many cases."

Mr. Stockdale spoke of the type of merchant who thinks he is performing a great feat of salesmanship when, owing to his failure to stock a particular line of goods for which the customer asks, he is able to sell other goods to the customer in their place. Regarding this practice Mr. Stockdale pointed to the dangers of substitution.

"What is the thing you sell in your store?" asked Mr. Stockdale. The correct answer was "service." "The thing the customer wants to have is satisfaction. Service is necessary to satisfaction. You may render service but if it is not of the right kind there will not be satisfaction.

Viewing Transactions From Both Sides of the Counter

"Our mail order houses in the United States are big and powerful as yours are. The head of one of the large mail order firms was asked the reason for the success of that particular business. His business has exceeded the record of $1,000,000 of orders in one day. His answer was as follows: 'The success of this institution is built on the fact that we endeavor always to view the transaction from both sides of the counter.'

"Your customer lays down his money on your counter for satisfaction," added Mr. Stockdale. "The home plate of every sale is satisfactin, and if your service does not take you around to the home plate you will be left on the bases and will not score. Satisfaction consists in bringing the right goods and the right people together. You must know the goods and know the people. The first job of a salesman is to know the goods, but after that he must study the people."

At this point Mr. Stockdale referred to the point, "The customer is always right," and issued a warning that if the customers were not always right they soon became other merchants' customers. "We have to acknowledge that some of them tell the plainest lies. If you will look for honest people you will find however, that the proportion of dishonest people is very small and very few will come back time after time and try to get the better of you. Give this class of customer plenty of rope and he will be shamed.

The Folly of Argument

"Don't argue with your customers. You will never sell anything through argument. Real salesmanship avoids arguments. Do not try to convince the customer or a controversy is bound to ensue. The salesman who starts in to contradict the customer makes a big mistake. I have observed a lot of salesmen who get overconfident in sizing up a customer, and I find that many of this type are missing many sales. It is dif-

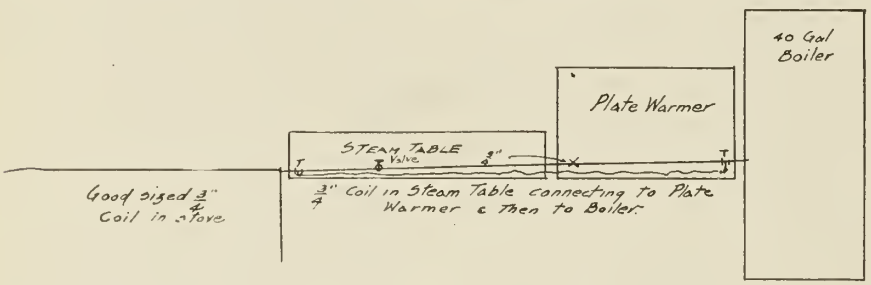
(Continued on page 35)

Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published--Description of Jobs Done or Shop Kinks Are Also Invited.

The Editor, Sanitary Engineer:

Dear Sir,—We have a problem which we would like to see solved, and any information you can give us will be greatly appreciated.

The trouble is in the connections of a range boiler, steam table, and plate warmer in a hotel here. I am enclosing a sketch to give you an idea of how we have it connected up. The trouble is that the pipes and fittings near the boiler are always giving out. They seem to be eaten up by some action of the water.


40 Gal Boiler
Plate Warmer
STEAM TABLE
Valve
3"
Good sized 3/4" Coil in stove
3/4" Coil in Steam Table connecting to Plate Warmer & then to Boiler

When the steam-table and plate-warmer are not in use, the valve on the return pipe to the boiler is opened, permitting the water to travel straight from the stove to the boiler, and when they want to use the steam-table and plate-warmer they just close the valve. This job works fine, it gives good service, and does not hammer, and we cannot see why these fittings and pipes will not stand up. The principal trouble is from the point marked X to the boiler. Would it make any difference if I connected the direct supply to the top of boiler and let the connection from the steam-table and plate-warmer go to the side? Our water pressure here is about 10 pounds.— H. B., B.C.

Electric Corrosion

Answer.—We take from your sketch that the wavy line is intended to indicate the direct connection at the top of heating coil in the stove and the side opening of the tank, and that the upper line, with valve shown on same, is a sort of by-pass line running through the steam-table and the plate-warmer, so that there is a positive flow of hot water travelling up from the coil to the tank, either by way of the direct connection or by way of the by-pass through the steam-table and plate-warmer. We assume that there is a cold water connection from the bottom of the tank to the bottom of the coil in the stove.

Now, if we are correct in our assumption, and if there are no traps in the plate-warmer piping the only thing that we can see that is causing the pipe in the plate-warmer to give out is electrolysis. This would be caused by having two different metals in the piping. Perhaps you have brass or a copper tubing in the plate-warmer and a wrought iron pipe connecting at the point X. If you are using well water, or in fact any kind with the exception of that of rain, you are bound to have an electric action in piping of different materials. There is nearly half a volt difference in the electric value of the materials of piping mentioned.

We would suggest that if there are different metals used in the make-up of the apparatus that you change over to all one metal, or if that is impossible substitute a lead-lined pipe where corrosion is taking place. When you substitute the lead-lined pipe, some corrosive action will take place on the lead, but this action of corrosion is such that it will change the nature of the lining of the pipe to a chemical body that will resist any further electrical action on the pipe itself. For instance, if the water is impregnated with chlorine the lead will be changed to chloride of lead, or if the water is charged with sulphur the reaction will be sulphide of lead.

We would like to have you send us about a pint of the water you are using in a container so that we could test it for electrical conductivity.

SANITARY ENGINEER:—

Dear Sirs:—In Question Box, June 1st issue, I note: Natural Vacuum System—I read with some interest the answer. Can you give me more information on this, and explain it, or can I get a book more fully explaining it, as I am working on an invention where natural vacuum would be of great help?

Another question: Is there such a thing as a thermostatic valve that will open with 200 degrees Fahrenheit, and close with 150 degrees, asd can stand or work on a 60 pound or 80 pound water pressure, or can such a thermostatic automatic valve be made, and if so, where can I get one, as an invention I am now working on depends upon that idea? I have one invention now that will heat three ordinary rooms with the heat now going to waste up the flue and is not utilized in the ordinary kitchen range or stove. I have connected up radiators, that is, pipe coil radiators, on a 60 pound pressure water, and heat three rooms, besides giving ample hot water for domestic purposes, but at times air pockets form and circulation seems to stop. Would a check valve hinder circulation on so great a pressure? The air pockets should be relieved at the high points, I know, but how to do this automatically is what I am working on now. Sometimes when range is used for baking the thermometer shows hot water from range entering coiler with tap com. at boiler. The thermometer registers 215° degrees Fahrenheit, which means, practically, that one pound of steam is there in some shape. I did not know that 1 pound of steam could be developed in a 30 gal. boiler full of water and 60 pounds water pressure feeding the tank.

Here is a query for you to answer:

At Bishop Du Vernet's house he wanted to draw a glass of cold water at his bathroom basin cold water tap. The pipes are buried fairly deep, none exposed. The longer he let the water run, the warmer it did get. Finally, it began to run hot, so he phoned the city, wanting to know when it had begun the free delivery of hot water. The city clerk told him that he must have a Harry Hanson coil in his neighborhood. The city clerk then 'phoned me that the Bishop had complained of not being able to get any cold water in his house and wanted to know if I had any of my coils installed in his neighborhood; I said there were three ¼ of a mile away, but there was one at about 1 block away, but I could not think that these should affect the city main pipe. Not long after the Bishop came in and wanted to know about my coil. I was scared and hardly knew what to say.

Now, I went out to investigate and found that by coincidence, or it just happened, that these four people were baking at the same time and that none of them could get any cold water for some time after. This scared me more, as I was installing coils about as fast as I could make and put them in, and it would mean loss of business in the coil business, and therefore hit upon the idea of heating the rooms with the extra heat through radiation. But what I want to know is, how could the main city pipe get the hot water in it? Several others have complained of this same trouble, too much hot water, and they don't want to install a radiation How can I overcome this? My idea of it is to put is a thermostatic valve, which will open when water gets 150 degrees hot, as that is hot enough. An ordinary 30 gal. boiler gets hot from top to bottom in 1 hour. Can you suggest something to remedy this, as the complaint is too much hot water?—H. H.

H. H., Prince Rupert, B.C. We will answer the queries contained in the above in the order that they are presented.

First: The principle of natural vacuum in heating systems is taken advantage of by many manufacturers of heating apparatus and we will refer your request for further information to some of these companies, so, no doubt, you will receive several books and letters describing their systems in detail.

Second: There are a number of thermostatic valves on the market operating on temperature ranges less than what you require, and we feel sure that where the thermostatic action is only to take place in such a range as mentioned that it would be a comparatively easy problem to devise something that would work even against the high pressure indicated. This question will also have to be handed to some of the manufacturers. However, we believe from your enquiry what you really wish is a thermostatic air vent to release the air from a hot water heating system. Frankly, we do not know of anything that would be practical working against such a pressure. The force of 80 lbs. is sufficient to lift a column of water about 185 feet in the air, so you can see from this what would happen if the air vent should open with that weight of water behind it.

Third: Regarding the formation of steam in the system. Water confined in a system at 60 lbs. pressure does not steam even at a temperature of 307 degrees Fahr. and the fact that the thermostat registers 215 degrees is not an indication, there being heat in the water to the extent of 1 lb. pressure—in fact at 60 lbs. pressure and the temperature at 307 degrees there is only a total heat of 1,175 B.T.U. when compared with the total of 1,146 B.T.U. of 212 degrees steam in an open vessel.

Fourth: If the hot water is backing from your coils into the city mains, the mains must be at a higher level than the coils. Perhaps the Bishop's house is set well above where your coils are located.

We do not think that the installation of a check valve would be advisable, as we consider that not having any relief for the system outside of the back pressure on the city mains that the damage from an explosion would be very great.

COMPARATIVE MERITS OF WATER SUPPLY SYSTEMS

Question.—Would a compressed air system operating a displacement pump in a well be as satisfactory generally for a private system of water supply as a pneumatic system using deep well pump to tank against air?

Answer.—The choice of systems in a case of this kind can be made only after closely studying the local conditions and deciding which will meet the most important essentials. Either system will satisfactorily meet ordinary requirements but such a consideration for instance as the location of the spring may be a deciding factor in the choice of system. If the spring or the well as the case may be is located some distance from the house a system with a pneumatic water storage tank in the basement of the building would probably be the most satisfactory all round. A fresh water system would be likely to give the best results if the spring or well is located close to the building.

It might be stated that both of the systems mentioned have their good points. By pumping against air pressure in a tank there is a lot of water stored in the tank. This may come in very handy in case anything should happen to the pump or the power source which drives the pump.

A feature that is provided by the other system is that fresh water may be pumped direct from the spring or well to the fixtures. This, of course, keeps the water from losing its fresh taste as it is liable to do if stirred for any length of time in a tank. Many people would prefer water of this kind and hence would favor the system which would provide it.

WOULD NOT BE ADVISABLE

Question.—A housing scheme is under consideration in our town and in order to help keep costs down some of those interested are urging that three inch soil pipe could be used for the four piece bathrooms that are planned, consisting of closet, bath, basin and sink. Would you advise the use of this size pipe and would there be after troubles from stoppage?

Answer.—We would not advise the use of three inch soil stack. It might in certain cases work out all right, and then again it might not. Throughout Canada, and, as a matter of fact, the United States as well, four inch soil pipe is accepted as the standard required in work such as is mentioned. This size has been decided upon, not as a result of chance, but as a result of years of experience. While a three inch pipe might reduce expenses very slightly, there is a chance that in the long run it would prove unsatisfactory and expensive, and might have to be replaced by the standard four inch pipe. The slight difference in cost in a case of this kind should not be allowed to weigh against the opinion of the best men in the trade, and they have adopted the 4-inch pipe.

HOUSING ENTERPRISE IN NOTTINGHAM

Among the first houses to be built under the British Government's housing scheme are those of a public utility society called the Swanpool Garden Suburb, Lincoln. They are intended mainly for the use of the employees of an engineering firm, which have taken a leading part in the promotion of the society. There is a management committee of 12, which includes a number of workpeople who will be tenants of the houses. There is also a woman's consultative committee to give advice as to housing from a woman's point of view.

The site obtained by the society comprises about 350 acres and it is proposed to build 3,000 houses. Provision has been made in the plans for the erection of public buildings, schools, institutes, laundries, swimming baths, etc., and a noteworthy feature of the scheme is the effort which has been made to preserve the existing natural beauties of the site.

The lighting and heating plans present novel features. It is proposed to employ waste heat and steam from the firm's works, and to have a combined system of central heating and hot-water supply to serve each house. In addition, electricity generated at a central station will be supplied to each house for lighting and cooking, and also to the village for different public purposes such as street lighting, laundry power, and sewage pumping. Construction work has already been begun in the case of twenty-six houses of the new village fronting an existing road.

PRACTICAL SHEET-METAL WORK

THREE PIECE ELBOW WITH GUSSET OR GORE PIECE.

By THOMAS STANFIELD

IN a letter from a reader, SANITARY ENGINEER is asked to describe how patterns for a branch pipe can be made, the branch to be at an angle of 45° from the main pipe.

As the size of pipe or branch required was not stated we are describing a method to adopt for both pipes of same diameter. But the same method can be followed even though the branch be a smaller diameter.

Fig. 1. Let E F G H L M N O P be the elevation, with A B C D the plan of main pipe and J K the plan of the branch piece.

First divide plan A B C D into equal parts 1, 2, 3, 4, 5, 6, 7 and repeat until the whole of the circumference is divided. Next draw dotted lines down until they intersect the joint at L M N.

Now divide plan of branch piece J K in the same manner as was adopted in plan A B C D.

Next draw dotted lines upwards from 1, 2, 3, 4, 5, 6, 7 plan J K until they meet the dotted lines drawn from plan A B C D. These lines should meet at the joint L M N.

The next step to take will be to draw stretchout lines, as shown in Fig. 2 and Fig. 3 respectively.

First draw the stretchout line Fig. 2 as shown at F E H G. These points give the total length of main pipe.

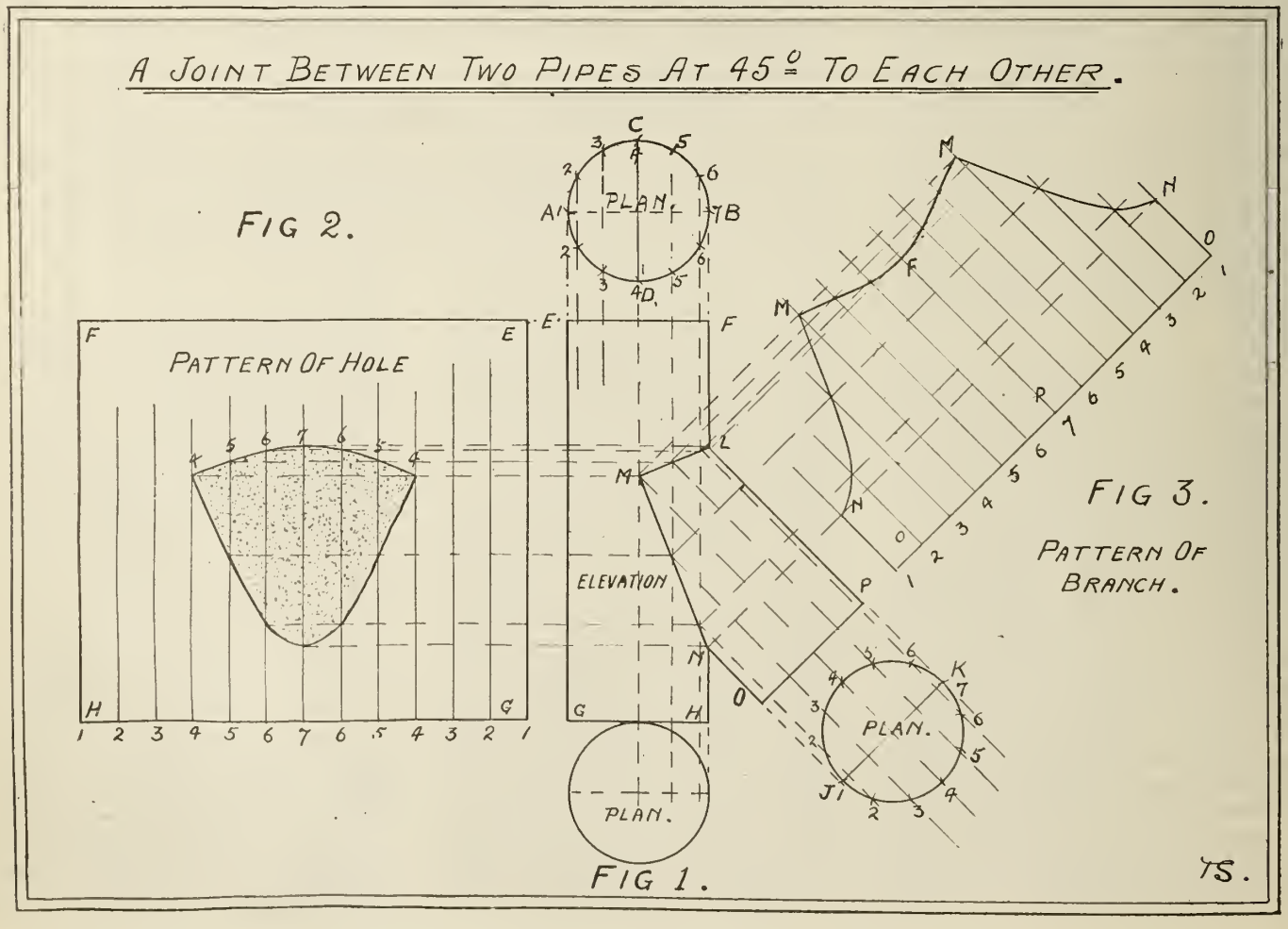
Now transfer the measurements on plan A B C D. 1, 2, 3, 4, 5, 6, 7 and repeat backwards, making 7 on line H G the centre.

Next draw the stretchout line for pattern of branch piece as shown by line O P O Fig. 3, and transfer the measurements from plan J K 1, 2, 3, 4, 5, 6, 7, repeating these backwards in same manner as was done in Fig. 2.

Now draw a number of dotted lines 4, 5, 6, etc., on both the stretchout lines in Figs. 2 and 3.

From line 7 Fig. 2 draw horizontal line until it meets point L on elevation, and repeat by drawing lines from 6,6 Fig. 2 to intersections on M L elevation until the four lines are drawn.

Continued on page 25



MARKET CONDITIONS AND TENDENCIES

(Continued from page 38)

of the dealers to let go of a considerable part of their holdings. They figure out that prices are not going to jump very much higher, especially in coppers. In fact it may be that they are now near the level that will make about as good selling as can be expected for some weeks.

Fairly large shipments of iron and steel are being made to the United States market. Canadian mills and foundries are not taking up very much material. Range of prices now in effect follows:

Dealers' Buying Prices—		
Tea lead	....	0 03½
Heavy lead pipe	....	0 05
Pipe scrap		8 00
Stove plate, per ton	....	12 00
No. 2 busheling	....	8 00
Yellow brass	....	0 08½
Red brass	....	0 13
Light brass	....	0 06
Scrap zinc	....	0 05
Heavy copper	....	0 16½
Wrought iron, No. 1, per gr. ton	....	15 00
No. 1 machinery cast	....	16 00
Heavy melting steel	....	12 00

Copper Gains Strength; Spelter, Antimony Up

INGOT METALS—Higher prices have been recorded in copper, spelter and antimony, and lead maintains a fairly strong position. A better feeling is shown in markets in the United States and same is geing reflected here. Tin is easier.

COPPER.—A sharp advance has been shown in copper since last issue, quotations moving up 4c per pound to 22½c. A much improved demand is in evidence with stocks reported ample.

TIN.—An easier tone is apparent in this metal, quotations being made at 55c to 56c per pound, a decline of from 2c to 3c per pound. The market in London, England, showed substantial advances during the week, but whether this will continue is still uncertain. The British situation, if continued on its present move, may affect the markets here and a reaction to higher levels set in.

SPELTER.—Quotations have stiffened, 8½c and 9c being asked for this. Business is showing some improvement.

LEAD. — The market maintains a fairly strong undertone and there is little new in the situation as it exists to-day. The price holds at 6½c to 6¾c per pound. Some efforts are apparent to create a bull market on this metal in the United States, but leading interests seem content to hold quotations steady.

ANTIMONY. — Continued strength marks the position of this metal and a further ½c advance has been made this week, bringing quotations up to 9½c per pound.

ALUMINUM.—A little more activity is apparent in this metal, with quotations now generally being named around 35c per pound.

SALESPEOPLE OF TO-DAY AND TO-MORROW

(Continued from page 31)

ficult to sell one article after having gone the limit in sales talk on another article ,and this is the danger if you make a mistake in sizing up what the customer wants before you know.

"When you try to sell a customer something they do not want they forget to come back to your store again. Be careful of over-insistence. Lead the customer instead of trying to drive. We are apt to siez the customer up according to our standards instead of according to their standards."

In referring to the customer who comes into the store and says that he or she is "just looking," Mr. Stockdale gave the following illustration:

"A Woodstock, Ont., merchant told of a lady who came into his store to look at certain goods which she was thinking of buying in the Fall—some few months later. The salesman explained that they would have some better lines in at that time, and suggested that she delay looking until the Fall, and then visit the store. The lady in question went to another store in town, and by the exertion of salesmanship was induced to buy goods on the spot."

Mr. Stockdale gave another illustration of how some merchants take much for granted and make a mistake in sizing up customers. He referred to the travelling salesman, who often makes purchases from merchants whom he usually visits in a business way. The point was emphasized that many merchants mistake good customers for salesmen, and do not give them even usual attention.

"The merchant who will not pay the greatest attention to the travelling salesman reaps his own reward," added Mr. Stockdale.

People Learning to Shop

"Merchants should also give customers the same attention when they do not buy as when they do make a purchase." The 5c, 10c and 15c store is teaching the people to shop. We are developing a nation of looker-shoppers. It is there they are getting their education.

"The customer who comes in to buy a 10c article should be given the same attention as the one who comes in to buy a $10 article. Take care of the people who come in to look. Don't let any lookers come in to your store, as far as your treatment is concerned.

"The attention you give to Mrs. Brown has a greater influence on your store than you imagine. Mrs. Brown takes a lot of your time and buys very little, and she is hard to wait on. When you take this attitude towards customers you are making the mistake of your merchandising life. You may call this customer what you please, but Mrs. Brown corresponds to the baseball fan. She is the store fan—what would baseball be without the fan? Mrs. Brown knows more about the merchandise than the clerk behind the counter. She asks questions which are hard to answer. Mrs. Brown belongs to all the clubs in the town and attends them regularly. Don't forget the stores are well discussed at these meetings. The reputation of your store is made or marred right there. Mrs. Brown is sending customers to your store or away from it. Get Mrs. Brown boosting for your store.

"A satisfied customer is the greatest advertisement. Mrs. Brown is satisfied or is a dissatisfied customer who gives much of her time giving word of mouth advertisng.

"Whenever you think of salesmanship you think of certain clerks who are born and not trained. If you have the right foundation, salesmen can be developed through experience, and if you do not have the right foundation you cannot develop a salesman. The study of the science of salesmanship is a good thing.

"The person who stands behind the counter to-day and succeeds is the person who really wants to serve the customer, the salesman who has the spirit of service. How many can say that their customers fell you like to serve them? If they feel that way they will come back to your store, but you must have the service spirit in your salesmanship.

"Don't forget the Biblical quotation: 'He who would be the greatest among you, let him be the most willing servant.'"

AMERICAN WIRE MILLS ARE RUNNING CLOSE TO CAPACITY

Reports from New York state that sales of wire products during June by the largest interests have run close to full capacity of the mills which means that approximately 200,000 tons have been disposed of to merchants and manufacturing interests in all sections for shipment over the next 60 to 90 days. Manufacturers' contracts generally run about three months, but in a few instances wnere needs have been pressing, contracting has extended over the fourth quarter of the year. Buying by distributors however has been confined to 60-day shipments.

It is notable that very heavy sales of fencing have been made for this time of the year for shipment into the agricultural districts. This is probably due to the relatively light buying earlier in the spring season when buyers were disposed to hold off in anticipation of lower prices. Another point of interest is that stocks in hands of consumers, jobbers and dealers as well as of manufacturers have been reduced to a very low point, and there is a disposition now to replenish stocks. In the case of the mills even stocks carried in warehouses have been about one-third of normal. The policy now is to replenish these stocks also, but mills are not operating up to the extent of specifications.

The mills of the American Steel & Wire company are operating about 80% of capacity, but the operating end is being urged to increase output to take care of the large increase in business that has been coming in in the last 60 days.

Market Conditions and Tendencies

STATEMENTS REGARDING SUPPLIES AND TREND OF PRICES

THE MARKETS AT A GLANCE

STEADY advances in the price of copper and ingot metals point to new and higher quotations on brass goods very shortly. Some manufacturers have already withdrawn quotations and new figures will, it is stated, be out shortly.

A new basis of quoting has been determined upon for lead and waste pipe with the object of minimizing frequent changes in list prices.

A reduction is now in effect in wrought iron nipples to bring the prices of these goods in line with revisions made in other lines.

With the exception of tin, which shows a decline of from two to three cents a pound, the market for ingot metals has been very strong. Lead is very firm, copper is up four cents, spelter prices have advanced and antimony shows an advance of half a cent.

Owing to labor troubles and lack of production it is difficult to obtain some lines of soil pipe at all. Stocks generally, it is stated, are very low.

As stated in the last issue of SANITARY ENGINEER, new quotations are now in effect on all lines of enamelware, baths showing an advance of ten per cent. and the other lines of five per cent. Manufacturers are having trouble in maintaining production, owing to the difficulty in obtaining molders and unskilled help.

Business in general is reported excellent. Great activity prevails in the building trade and indications are that it will be even greater. The class of buildings being erected calls for a large amount of plumbing goods and some manufacturers are now booked ahead with orders for some time.

TORONTO, July 15.—Brass goods are one of the centres of interest in the trade at present and owing to advances made in prices of copper and ingot metals some manufacturers have withdrawn all quotations on valves and other lines. New figures which will be higher are expected. Prices of cotton waste have been reduced, the new quotations being from ¼ to 1¼ cents a pound lower than former prices. A reduction is also in effect in wrought nipples. Higher prices for all lines of enamelware. A new basis of quotation for lead and waste pipe has been arranged. As a result of no settlement having been reached in connection with the strike stocks of soil pipe are getting very low and some lines are very difficult to obtain.

Higher Quotations On All Enamelware

ENAMELWARE.—As stated in the last issue of SANITARY ENGINEER an advance of ten per cent. on baths and five per cent. on other lines is now in effect. Manufacturing costs continue high and there is great difficulty being experienced in securing skilled help and also molders. As far as the business outlook is concerned, it is excellent and orders continue to come in from all parts of the country in numbers that are most satisfactory. Reports received from those in close touch with building activity indicate that a lot of new work is developing, which will result in a steady demand all season for all lines of plumbing goods. Many large projects are also getting under way. Quotations on a few of the well-known lines of enamelware are as follows:

Bath tubs, rill rim, 4, 4½, 5 feet, 24 to 30 in. wide		$35 30
Bath tubs, 5½ ft.		39 25
Basins, flat back, 14 x 15 in.		6 80
Do., corner, 15 in.		7 50
Sinks, roll rim, 18 x 30 in.		15 80
Sinks, flat rim, 20 x 30	$6 77	6.65
Do., 18 x 30	5 80	5 99
Do., 18 x 24	5 37	5 25
Do., 16 x 24	5 17	5 05
Do., 14 x 20	4 45	....
Closets, oak tank and seat	....	25 50
Do., enamel iron or white vitro tank	....	27 50

Range Boiler Prices Remain Unchanged

RANGE BOILERS.—A nice volume of business is being handled in these lines and it has been showing a steady improvement with prospects that it will remain good throughout the season. The demands for homes are very brisk and builders all over the country apparently are realizing that there is money to be made and are getting busy. Reports show that not for a long time have so many blocks of houses been under construction. More than 400 dwellings are already under way under the Housing Commission's plans, and many private individuals are erecting three, six and ten houses. Prices of range boilers show no change and the quotations are:

Range Boilers	Standard	Extra Heavy
30-gallon	$11 00	$12 50
35-gallon	12 50	14 50
40-gallon	13 50	15 50
52-gallon	20 50	25 00
66-gallon	32 00	38 00
82-gallon	40 00	47 00
100-gallon	50 00	58 00
120-gallon	60 00	67 00

Soil Pipe is Firm; Decline in Nipples

SOIL PIPE, FITTINGS.—Not for a long time have stocks of some lines of soil pipe been as low as they are at the present time. This is due to the strike which has now been in effect for some time and is still unsettled. As far as business is concerned it has been excellent, but with stocks the way they are it is difficult to fill some of the orders. There is every indication that prices are going to advance.

Wrought nipples have registered a sharp decline. Wrought couplings and wrought pipe are not affected by this change.

The present scale of discounts which are applying on wrought nipples are for 4 in. and under 80 per cent., replacing a former discount of 60 per cent.; 4½ in. and larger are now quoted at 70 per cent., replacing a former discount of 50 per cent. and 4 in. and under running thread are now quoted at 50 per cent., replacing a former discount of 30 per cent.

Quotations are as follows:

Medium and extra heavy soil pipe, 2, 3 5 and 6 in.	20%
Medium and extra heavy soil pipe, 4 in.	25%
Medium and extra heavy soil pipe, 2 in. to 6 in.	35%
8 in. extra heavy pipe and fittings	15%

PIPE FITTINGS

Cast iron fittings	20%
Plugs	35%
Bushings	35%
Unions, ¼" to 2½"	50%
Do., ⅛", 3" and larger	45%
Dart unions, ¼-inch to 2-inch	25%
Do., 2½-inch and larger	15%
Nipples, up to 4-inch	80%
Do., 4½-inch and larger	70%

MUELLER

Water, Gas and Brass Plumbing Goods

CANADA'S BEST

We wish to direct your attention to the fact that there is nothing in water, plumbing or gas brass goods practice that we do not manufacture. The test of over 60 years of producing nothing but the very best in these lines conclusively proves that we are the masters of such manufacture.

We are illustrating a few of our various lines and wish to direct your attention to the fact that—

Our 1919 Catalog A is ready for distribution.

WE MAKE:

1—Tapping Machines
2—Corporation Cocks
3—Goose Neck Connections
4—Ground Key Curb Cocks
5—Rapidac Bath Cocks
6—Rapidac Basin Cocks
7—Globe Valves
8—Drilling Machines
9—Regulating Valves
10—Meter Testers
11—Bath Supplies
12—Service Boxes
13—Basin Combinations and many other articles of highest quality.

H. Mueller Mfg, Co., Limited

SARNIA, ONT. CANADA

Do., running thread 4-in. and under....	50%
Couplings, 4-in. and under	40%
Do., 4½-in. and larger	20%

MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittings, Class A, lb.	$0 50	$0 60
Do., Class B, lb. net	0 22	0 30
Do., Class C, lb. net	0 14	0 21

Advance is Looked For In Brass Steam Goods

VALVES.—Some manufacturers have withdrawn quotations on all lines, and this undoubtedly indicates that new figures are in preparation. That they will be higher is a foregone conclusion, owing to the advances that have taken place in copper and the high cost of production generally. Manufacturers report that business has been good with prospects that it will continue so. Marine orders continue to come in steadily. Quotations which are still in effect are as follows:

Compression work, standard	50
High grade	49
Fuller work, standard	45
High grade	38
Basin cocks, No. 0 standard	40
Nos. 1 and 2	40
Bath cocks, compression	50
Bath cocks, Fuller	45
Flatway stop and waste cocks, standard.	50
High grade	47
Roundway stop and waste cocks, standard	50
High grade	47
Brass steam cocks, standard.....Net List	
Globe, angle and check valves, standard.	23%
Do., removable disc	22%
Radiator valves, standard	31%
Do., removable disc .....Net List	
Basin Cocks—	
No. 0 and 1, Fuller pattern	45
Compression	40
Quick opening	50
Globe, angle and check valves, standard, medium pressure	23%
Radiator valves ,standard med. pressure	31%
Radiator valves, removable seat, medium pressure	25

Wrought Pipe Holds Unchanged

WROUGHT PIPE.—The market is steady on wrought pipe. No change is shown in the new list published under date of July 4, except in wrought nipples as mentioned above. Prices appear below. Manufacturers and jobbers report a distinct improvement in the volume of business they are doing.

WROUGHT PIPE

Price List No. 40, July 4, 1919

Standard Buttweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
⅛ in.	$ 6 00	$ 8 00	$.....	$.....
¼ in.	4 53	6 66	5 13	7 26
⅜ in.	4 53	6 66	5 13	7 26
¾ in.	5 99	7 57	6 84	8 42
½ in.	7 53	9 66	8 68	10 81
1 in.	11 14	14 28	12 84	15 98
1¼ in.	15 07	19 32	17 37	21 62
1½ in.	18 01	23 10	20 76	25 85
2 in.	24 24	31 08	27 94	34 78
2½ in.	38 90	49 73	.....	.....
3 in.	50 87	65 03	.....	.....
3½ in.	64 86	81 88	.....	.....
in.	76 85	97 01	.....	.....

Standard Lapweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
2 in. .....$	27 94	$ 34 78	$ 31 64	$ 38 11
2½ in.	40 66	51 48	46 51	57 33
3 in.	53 17	67 32	60 82	74 97
3½ in.	66 70	83 72	75 90	92 92
4 in.	79 03	99 19	89 93	110 09
4½ in.	88 00	113 00	107 00	132 00
5 in.	103 00	132 00	125 00	154 00
6 in.	133 00	171 00	162 00	200 00
7 in.	175 00	224 00	211 00	259 00
8L in.	184 00	235 00	221 00	273 00
8 in.	212 00	271 00	255 00	314 00
9 in.	254 00	324 00	305 00	376 00
10L in.	235 00	301 00	283 00	349 00
10 in.	303 00	387 00	365 00	449 00

Terms, 2% 30 days, approved credit.
Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Boiler Tubes Maintain Position

BOILER TUBES.—Boiler tubes are without any quotable change this week and jobbers report a fairly nice volume of business being handled. Quotations follow:

BOILER TUBES—	Seamless	Lapweld
1¼ inch	$27 00	$.....
1½ inch	28 00	.....
1¾ inch	30 00	26 00
2 inch	30 00	26 00
2¼ inch	33 00	28 00
2½ inch	40 00	32 00
3 inch	46 00	38 00
3¼ inch	.....	45 00
3½ inch	56 00	42 00
4 inch	70 00	54 00

Cotton Waste Prices Revised Downward

WASTE, OAKUM.—In line with information given out in these columns on June 15, prices on cotton waste have been revised downward and new quotations now available show a reduction of from ¼c to 1¼c per pound in some quarters. The figures now prevailing on lines of white cotton waste that have changed are as follows: XXX, 18c per pound; XX, 16¾c; X, 15¾c; XC, 13½c; Japanese, 13c; those ruling on colored waste are: No. 5, 13¾c per pound; No. 1, 12¾c; No. 7, 11¾c; No. 1A, 10¾c; No. 1B, 9¾c. An improvement in volume of business is reported.

No new developments are yet shown in respect to oakum, prices holding steadily and demand very fair. The prices follow:

	Per 100 lbs.	
Best American	$21 00	$22 00
Clipper, spun	.....	21 00
Do., unspun	.....	10 50
Plumbers' spun	.....	9 50

Sheets and Plates Continue Active

SHEETS, PLATES—The general view held in regard to business coming to hand at the present time on sheets and plates is that there is a very satisfactory volume of trade. Prices are very well maintained, although it is indicated some slightly lower figures are offered in some quarters on black sheets, though this is not expected to last. A report to-day from Buffalo shows where one big interest have stopped taking orders for wire products for the present, and that their tin plate mill is operating to 75 per cent. of capacity. All over reports indicate an increasing inquiry for all iron and steel products with sheets perhaps the slowest to respond. Prices are firm at following figures:

10 gauge	$4 75	$5 45
12 gauge	4 80	5 50
14 gauge	4 85	5 10
16 gauge	4 95	5 20
18-20 gauge	5 80	....
22-24 gauge	5 85	....
26 gauge	5 90	....
28 gauge	6 00	....
3-16 inch plate	4 90	6 25
¼-inch boiler plate	4 50	5 80

Prices shown are for full cases. An extra charge of from 25c per 100 lbs. is made for less than case lots.

GALVANIZED SHEETS.

10¾ oz.	$7 80	$8 10
U.S. 28	7 40	7 70
U.S. 26	7 10	7 40
22 and 24	6 95	7 25
18 and 20	6 80	7 10
16	6 65	6 95
12 and 14	6 50	6 80

An extra is now charged on galvanized sheets. 10¾ oz. and 28 ga., when shipped out in sheets 3 feet wide. The extra charged over prices shown above is 20c per 100 pounds. Other gauges show no change for different widths.

Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

New Basis On Lead and Waste Pipe

LEAD AND ZINC PRODUCTS. — A new basis of quoting has been determined upon in lead and waste pipe, which it is thought may result in minimizing frequent changes in the list prices. List prices have been advanced 1c per lb., making the list on lead pipe 12½c and lead waste pipe, 13½c, and to which a discount of 10 per cent. now applies; sizes over 8 in. take a list of 14½c.

There has been no change in prices shown below on solder. Business in these various lines is reported very satisfactory.

Lead pipe, list, per lb.....	....	$0 12½
Lead waste pipe, list, per lb.....	....	0 13½
Do., over 8 inches, list, per lb....	....	0 14½
Above subject to discount of 10%.		
Lead traps and bends	....	15%
Lead wool, lb.	0 11	0 12½
Lead sheets, 4 to 6 lbs., sq. ft., in rolls, lb.	0 11	0 12½
Cut sheets ½ to ¾c lb. extra and cut sheets to size, 1c lb. extra.		
Solder, guaranteed, lb.	$0 33	$0 37
Solder, strictly, lb.	0 31	0 35
Solder, commercial, lb.	0 28	0 31
Solder, wiping, lb.	0 27½	0 30
Solder, wire, lb.	0 34	0 40
Zinc sheets, per lb.	....	0 17

Scrap Prices Show General Revision Up

OLD MATERIALS.—There has been a general revision upward in scrap prices this week and a much better feeling prevails throughout the trade. Even higher prices seem to be well within the realm of possibility now. It is said there is a movement on the part of some

(Continued on page 35)

American Plumbing Supplies and Jobbers

14 CRAIG ST. WEST, MONTREAL

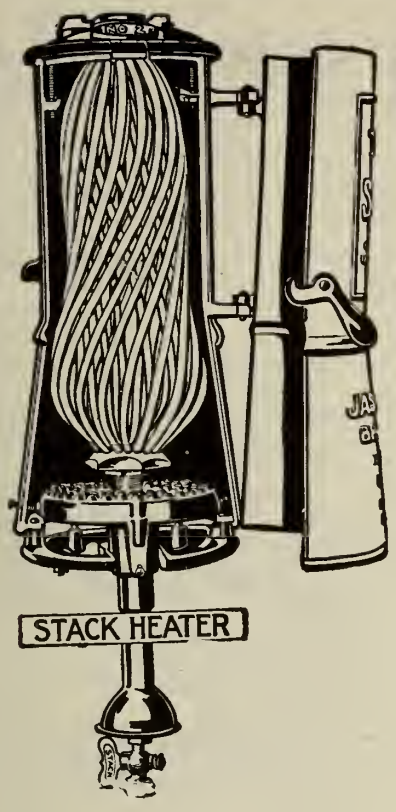
COHEN BROS., PROPS.

BUSINESS FOR SALE

LIVE PLUMBING, TINNING AND ELECTRIC wiring business for sale. Good town, with good connections. Much work in prospect. Will require about $10,000 to finance. Good opening for energetic firm. Enquiries from those meaning business only are solicited. For further information write the Standard Sanitary Mfg. Co., Box 292, Hamilton, Ontario.

WANTED

WANTED—I AM OPEN TO CONTRACT FOR well advertised lines for the general store trade in north half or whole of Saskatchewan; well connected with general stores; own auto and have warehouse and show rooms. Will furnish bonds or references. Box 42, Sanitary Engineer.



The Evidence Is There

The big feature of the Stack Gas Water Heater is readily apparent.

Your arguments may be clinched by simply opening up the Heater. Those near perpendicular copper tubes will convince your customers. They can see at once that the water is subjected to intense heat. They will understand how small columns of water will heat quicker than in a large coil. The fact that the *Stack Gas Water Heater* heats water in one minute will make sales for you. You will have no trouble convincing your customers that this is the best heater on the market to-day.

Display card sent on request.

The James Morrison Brass Mfg. Co., Ltd.

93-97 Adelaide Street West - TORONTO

This syphon is made in one piece. It has no joints.

YOUR SYPHON

THE success or failure of your domestic sewage disposal system depends to a very great extent upon your syphon. If that fails your whole system is a failure. You cannot afford to take risks, therefore install "ANTHES" syphons.

The "ANTHES" syphon is superior because it is cast entirely in one piece, so having no joints to leak. It is the only syphon which operates on natural law.

Let your syphon be "ANTHES"

Athens Foundry, Limited

Toronto and Winnipeg

Classified Buyers Guide

Occasionally advertisements are inserted in the paper after this page has gone to press. The insertion of the Advertiser's name on this page is not part of the advertising order, but is inserted solely for the convenience of the reader of the paper

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Wm. B. Scaife & Sons Co., Oakmont, Pa.

AIR LINE SYSTEMS
C. A. Dunham Co., Ltd., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

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Canadian Wolverine Co., Ltd., Chatham.
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Wallaceburg Brass & Iron Mfg. Co., Ltd., Wallaceburg, Ont.

ASBESTOS GOODS
James Morrison Brass Mfg. Co., Toronto.
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BOILERS, STEAM OR HOT WATER
Gurney Foundry Co., Limited, Toronto.
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Lord & Burnham Co.. Ltd., Toronto.
Modern Heating & Eng. Co., Ltd., Montreal.
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Warden King, Ltd., Montreal.

BOILER FEED REGULATORS
Empire Mfg. Co., London and Toronto.
C. A. Dunham Co., Ltd., Toronto.
James Morrison Brass Mfg. Co., Toronto.

BOILER FITTINGS
Fittings Limited, Oshawa.

BOILER STANDS
Fittings Limited, Oshawa.

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Joseph Breeden & Co., Ltd., Birmingham, Eng.
Canadian Brass Co., Ltd., Galt, Ont.
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Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Limited, Galt.
G. & W. G. Gummer Ltd., Rotherdam, Eng.
Kerr Engine Co.. Ltd.. Walkerville.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co.. Ltd.. Sarnia, Ont.
United Brassfounders & Engineers, Ltd., Cornbrook. Manchester, England.
Wallaceburg Brass & Iron Mfg. Co., Ltd., Wallaceburg, Ont.

BRASS PIPE AND TUBE
Canada Metal Co., Ltd., Toronto.
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Galt Brass Co., Limited, Galt.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
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CHAIN WRENCHES
Trimont Mfg. Co., Roxbury, Mass.
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Canada Metal Co., Ltd., Toronto.
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C. A. Dunham Co., Ltd., Toronto.

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Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Fittings Limited, Oshawa.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
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United Brassfounders and Engineers, Ltd., Cornbrook, Manchester, England.
Warden King, Ltd., Montreal.

DRINKING FOUNTAINS
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
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Amherst Foundry Co., Ltd., Amherst, N.S.
Canada Metal Co., Ltd., Toronto.
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Galt Brass Co., Limited, Galt.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co.. Ltd.. Sarnia, Ont.
Port Hope Sanitary Mfg. Co., Ltd., Port Hope.
Standard Sanitary Mfg. Co.. Ltd., Toronto.

ENGINEERS
Modern Heating & Eng. Co., Ltd., Montreal.

ELECTRIC PUMPING MACHINERY
Empire Mfg. Co., Ltd., London and Toronto.
H. Mueller Mfg. Co.. Ltd., Sarnia, Ont.

EXPANSION TANKS
Wm. B. Scaife & Sons Co., Oakmont, Pa.
Toronto Hardware Mfg. Co., Ltd., Toronto.

FUEL SAVING DEVICES
Modern Heating & Eng. Co., Ltd., Montreal.

FITTINGS
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Fittings Limited, Oshawa.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co.. Ltd.. Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

FITTINGS, CAST IRON, SCREWED, FLANGED, DRAINAGE AND MALLEABLE, SCREWED
Fittings Limited, Oshawa.

FILTERS (WATER)
Wm. B. Scaife & Sons Co., Oakmont, Pa.

FLUSHOMETERS
Canada Metal Co., Ltd., Toronto.
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Toronto.
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Standard Sanitary Mfg. Co., Ltd., Toronto.

FLOOR AND CEILING PLATES
Beaton & Cadwell Mfg. Co., New Britain, Conn.
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James Morrison Brass Mfg. Co., Toronto.

FURNACES
Gurney Foundry Co., Limited, Toronto.
Steel & Radiation, Ltd., Toronto.

GAS APPLIANCES
Consumers' Gas Co., Toronto.

GASOLINE ENGINES
Empire Mfg. Co., Ltd., London and Toronto.

GAS WATER HEATERS
Consumers' Gas Co., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto
H. Mueller Mfg. Co . Ltd., Sarnia, Ont.

GLOVES, WORKING
R. G. Long & Co., Toronto.

GRATES FOR RANGES, FURNACES AND BOILERS
McIntyre & Taylor, Toronto.

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Fittings Limited, Oshawa.

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Galt Brass Co.. Galt, Ont.
James Morrison Brass Mfg. Co.. Toronto.

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C. A. Dunham Co., Ltd., Toronto.
Modern Heating & Eng. Co., Ltd., Montreal

HEATERS
Lord & Burnham Co.. Ltd., Toronto.
Modern Heating & Eng. Co., Ltd., Montreal.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal and Toronto.

HEATING SYSTEMS
C. A. Dunham Co., Ltd., Toronto.
Modern Heating & Eng. Co., Ltd., Montreal.

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McIntyre & Taylor, Toronto.

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Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Hoyt Metal Co., Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co.. Ltd.. Sarnia, Ont.

MALLEABLE IRON CASTINGS
Gurney Foundry Co., Limited, Toronto.
Fittings Limited, Oshawa.

MIXING VALVES
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Port Hope Sanitary Mfg. Co., Ltd., Port Hope.

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G. & W. G. Gummer, Ltd., Rotherham, Eng.
Trimont Mfg. Co., Roxbury, Mass.

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Canadian Wolverine Co., Ltd., Chatham.
Canadian H. W. Johns-Manville Co., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.

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PIPE AND RADIATOR HANGERS
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Beaton & Corbin Mfg. Co., Southington, Conn.
Fittings Limited, Oshawa.

PIPE, BLACK AND GALVANIZED
Canadian Tube & Iron Co., Ltd., Montreal.
Consumers Metal Co., Ltd.
Empire Mfg. Co., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.

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Empire Mfg. Co., Ltd., London and Toronto.
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Canadian Wolverine Co., Ltd., Chatham.

Canadian H. W. Johns-Manville Co., Toronto.
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PIPE, SOIL, AND FITTINGS

Anthes Foundry Co., Toronto and Winnipeg.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Toronto Hardware Mfg. Co., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.
Warden King, Ltd., Montreal.

PIPE THREADING TOOLS AND MACHINERY

Borden Canadian Co., Toronto.
John Hall & Sons, Ltd., Brantford.
A. B. Jardine & Co., Hespeler.
Wells Bros., of Canada, Galt.

PIPE WRENCHES

Borden Canadian Co., Toronto.
Trimont Mfg. Co., Roxbury, Mass.
J. H. Williams Co., Brooklyn, New York.

PNEUMATIC WATER SUPPLY TANKS

Empire Mfg. Co., London and Toronto.
Wm. B. Scaife & Sons Co., Oakmont, Pa.

PORCELAIN WARE

Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
R. MacDougall & Co., Ltd., Galt.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

RADIATOR FOOT RESTS

Beaton & Cadwell Mfg. Co., New Britain, Conn.

RADIATORS

Gurney Foundry Co., Limited, Toronto.
Lord & Burnbam Co., Ltd., Toronto.
Steel & Radiation, Ltd., Toronto.
Warden King Ltd., Montreal.

RADIATOR TRAPS (STEAM)

Canadian H. W. Johns-Manville Co., Toronto.
C. A. Dunham Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

RANGE BOILERS

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Toronto Hardware Mfg. Co., Toronto.

REDUCING PRESSURE VALVES

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James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

ROOF FLANGES AND FLASHINGS

Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., London and Toronto.

RUBBER GOODS

Canadian Consolidated Rubber Co., Ltd., Montreal.

SASHWEIGHTS (Patent Eye)

Fittings Limited, Oshawa.

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SOLDER

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Kerr Engine Co., Walkerville, Ont.
James Morrison Brass Mfg. Co., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

STEAM TRAPS

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United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

STOVES

Gurney Foundry Co., Limited, Toronto.

STOVES, GAS AND COAL

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SMOKE TEST MACHINES

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Wm. B. Scaife & Sons Co., Oakmont, Pa.

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TRAPS, CAST IRON

Fittings Limited, Oshawa.

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Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
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Williams, J. H., & Co., Brooklyn, N.Y.

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Empire Mfg. Co., Ltd., London and Toronto.
Fittings Limited, Oshawa.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

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C. A. Dunham Co., Ltd., Toronto.

VITRO TANKS

Galt Brass Co., Ltd., Galt.

VACUUM SYSTEMS OF HEATING

C. A. Dunham Co., Ltd., Toronto.

WATER SUPPLY TANKS

Wm. B. Scaife & Sons Co., Oakmont, Pa.

WATER SUPPLY SYSTEMS

Empire Mfg. Co., London and Toronto.

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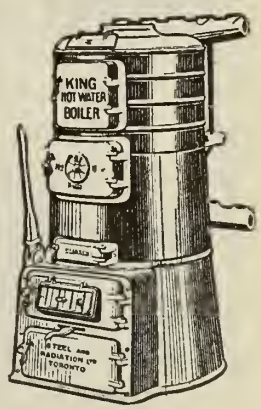
Fittings Limited, Oshawa.

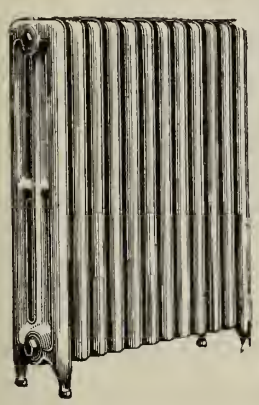
WASHING MACHINES

Gurney Foundry Co., Limited, Toronto.

Simple, Efficient and Satisfactory

You, sir, as a reputable Heating Engineer, cannot take chances with your reputation by installing any heating system other than the best. The King Boiler with Imperial Radiators is a system that once installed will be a salesman working in your interests to secure more orders. No complaints and lots of compliments after installation is the record of





KING HOT WATER BOILERS AND IMPERIAL RADIATORS

Advise your customers to put in their Heating Systems now—the price will not be any lower and best work can be given to early orders.

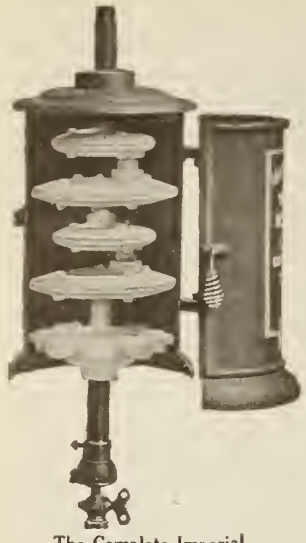
STEEL AND RADIATION, LIMITED

Manufacturers of Hot Water *and* Steam Boilers *and* Radiators; Fenestra Steel Sash *and* Concrete Reinforcing

Head Offices: Fraser Ave., Toronto **Sales Offices: Quebec, Montreal, Toronto**

Western Agents: The J. H. Ashdown Hardware Company, Limited, Winnipeg

A Complete Stock of all Lines is Carried at our Montreal Warehouse



The Complete Imperial Water Heater

BY installing "IMPERIAL" heaters, you serve your customers' interests, as well as your own.

"IMPERIAL" heaters, are made in three sizes, for the ordinary, heavier, or heaviest requirements.

PERFECT HEAT baffling. Absolute water CIRCULATION.

Sectional View Showing Water Flow

POWERFUL. ECONOMICAL.

For either ARTIFICIAL or NATURAL Gas.

IMPERIAL CITY HEATERS, LIMITED

SARNIA, CAN.

Men Worth Reaching

THE SANITARY ENGINEER, Plumber and Steamfitter of Canada, was established in 1907. The subscribers represent the most progressive members of the sanitary plumbing and heating trade in Canada. The paper is issued twice monthly, on the first and fifteenth of the month. Circulates in all provinces of Canada and also in Newfoundland. There is no waste circulation on SANITARY ENGINEER, because subscribers buy the paper for business. The advertising pages are read closely by the largest buyers of sanitary and heating goods in Canada. These men buy for business as well as for private consumption and therefore represent the best class of readers. When you advertise in the SANITARY ENGINEER you are assured of an attentive audience, who are looking for information about your goods and your method of doing business. Cost of advertising is very moderate indeed. We will gladly supply detailed information regarding rates, circulation, etc.

"Wolverine"

Tank Balls

"That Seat"

Sure Seat

is the name

Why not order an assortment which will give you a size for every requirement.

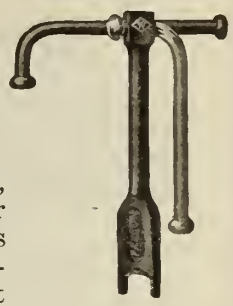
"C" Catalog "C"

Write for Prices.

CANADIAN WOLVERINE CO., LTD.

CHATHAM, ONTARIO

Williams' "Falcon" Drop-Forged Waste Plug Spanner



THE old adage tells us, "Necessity is the mother of Invention," but makes no mention of the father; presumably he is "mere man." At any rate, we are rather proud to have "fathered" the invention of the useful and badly needed tool here illustrated.

It is far more efficient than any possible makeshift, and its folding handle allows it to be readily carried in the pocket. The dimensions of the "finger ends" make it universally adaptable to all sizes and forms of basin and sink plugs and grates. The tool is hardened for severe service. Descriptive Booklet on request.

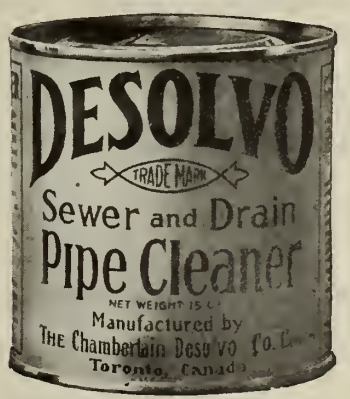
J. H. Williams & Co.

"The Wrench People"

77 Richards St., Brooklyn, N.Y.

THE A. G. LOW CO., LTD.
77 Pacific Ave., Saskatoon, Sask.
Agents for Alberta, Saskatchewan, British Columbia and Manitoba

DESOLVO



DESOLVO readily mixes with cold water, generating a tremendous heat. It will cleanse a clogged waste pipe in a jiffy. Desolvo saves time and money and lets you out of a dirty job. You leave your customer just a bit more than satisfied.

The Chamberlain Desolvo Co.
Limited

110 Church St., Toronto

Eastern Canada Representatives: Richardson & Bureau, 55 St. Francis Xavier St., Montreal
General Offices - - - - - Pittsburg, Pa.

Steel Tanks for Every Purpose

A FEW "SCAIFE" SPECIALTIES:

Air Receivers
Boilers—Hot Water
Expansion Tanks
Filters (water)
Hot Water Tanks
Hydro-Pneumatic Tanks
Range Boilers
Tanks (steel)
Water Supply Tanks

117 years old Founded 1802

WM. B. SCAIFE & SONS CO.

New York, N.Y. Office: 26 Cortlandt St. Home Office: Pittsburgh, Pa.
Chicago: 38 South Dearborn St.

The Wrench of 25% Greater Efficiency

TRIMO PIPE WRENCH

Two new features have been recently added to the Trimo Pipe Wrench, namely Nut-Guards, in all sizes, and unbreakable steel frames, in leading sizes.

The Nut-Guards prevent the accidental rotation of the nut while in use.

These improvements add 25% to the usefulness of the tool.

The Trimo Pipe Wrench is made with wood handles in 4 sizes, 6-in., 8-in., 10-in., 14-in. and in steel handles in all sizes, 6-in. to 48-in. inclusive.

All Trimo Pipe Wrench parts are interchangeable.

The inserted jaw in the handle can be readily replaced when worn, thus adding to the life of the tool.

Nut with Nut-Guards

Inquiries from Importers and Dealers Solicited. Send for Catalogue No. 55.

TRIMONT MANUFACTURING CO.

Cable Address: Triwrench
Code: Western Union

Roxbury (Boston) Mass., U.S.A.

FIRE ANNOUNCEMENT

WE are pleased to state that the fire which occurred in our Plant on Saturday, June 21st, will not have any serious results to our customers.

WE have a large stock of finished Pumps, Cylinders, etc., which were not anywhere near the fire and quantities of parts already made will enable us to take care of any needs.

PATTERNS are in course of manufacture so that we anticipate no inconvenience to our customers. Advance orders are solicited.

THE R. MACDOUGALL CO.

LIMITED

GALT, ONT., CANADA

PIPE AND THE PUBLIC WELFARE

By R. C. McWANE

A Book Just Off the Press

Every sanitary engineer should be the possessor of this book. It deals with pipe-making of all kinds, cast iron, wrought iron, steel, wood and tile pipe. It is valuable because it gives the users of pipe a true idea of how pipe lasts under various conditions when in service.

Price $1.00 Postpaid

MACLEAN PUBLISHING CO., LIMITED, Book Dept., University Ave., TORONTO

INDEX TO ADVERTISERS

Allison, K. B. 2
American Plumbing Supplies 38
Amherst Foundry Co.....Inside Front Cover
Anthes Foundry Co..... 39
Armstrong Mfg. Co..... 48

Beaton & Cadwell..... 46
Beaton & Corbin..... 48
Borden Canadian Co..... 48
Bottum Valve Co..... 47

Canada Metal Co..... 11
Can. Society of Domestic Sanitary and Heating Engineers 3
Canadian Tube & Iron Co..... 47
Canadian Wolverine Co..... 43
Chamberlain Desolvo Co..... 43

Empire Manufacturing Co.....
Outside Front Cover

Gummer, G. W. C., Ltd. 8
Gurney Foundry Co., Ltd..... 47

Hause Mfg. Co., Chas. F..... 48
Hoyt Metal Co..... 46

Imperial City Heaters, Ltd..... 42
International Malleable Iron Co.....
Inside Back Cover

Jardine, A. B., & Co..... 2

Katie Foundry, The..... 48
Kerr Eng. Co., Ltd.....Inside Back Cover

Long, R. G., & Co..... 43
Lord & Burnham 7

McDougall & Co., R..... 44
McIntyre & Taylor, Ltd..... 46
Moline Heat..... 5
Morrison Brass Mfg. Co., Ltd., Jas..... 39
Mueller Mfg. Co..... 37

Port Hope Sanitary Mfg. Co..... 12

Scaife & Sons Co., Wm. B..... 44
Standard Sanitary Mfg. Co..... 1
Steel & Radiation, Limited..... 41

Taylor-Forbes 9
Trimont Manufacturing Co..... 44
Toronto Hardware Mfg. Co..... 46

United Brassfounders & Engineers, Ltd... 9

Wallaceburg Brass & Iron Co..... 4
Warden-King, Limited..... 4
Wells Bros. of Canada..... 5
Williams, J. H., & Co..... 43

X Laboratories..... 45

There's Something about an Original that Can Never be Imitated!

IF you've ever heard Harry Lauder sing his Scotch songs you could tell an imitation with your eyes shut.

You've seen Charlie Chaplin do his stunts—do you think an imitator could fool the people?

Whether it's real diamonds or paste —whether it's pure gold or brass—an imitation is simply an imitation—**and nothing else.**

That's why the thoughtful steamfitter isn't going to fall for anybody's talk about something "just as good" as "X" Boiler Liquid. He knows that for positive results it is safer to stick to the original. An imitation of the genuine "X" may look like it—but that's all. Patents are allowed on the "X" Liquid process. Its quality **can't** be imitated. Imitations of the genuine "X" Liquid cause foaming. **"X" will prevent foaming.**

No fitter can afford to experiment with his profits. When you get a leaky or cracked boiler job you want to know that you can send any man to that job —have him finish it quickly—otherwise there's the kicking, the arguing and the time-wasting that is utterly useless from a money-making standpoint.

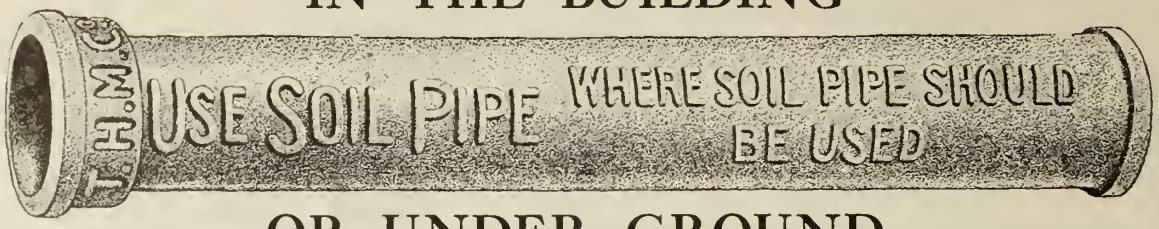
Over 25,000 steamfitters now know that "X" Liquid is the **only** scientific process for repairing leaky and cracked boilers—and for making them LEAKPROOF—RUSTPROOF — AND SCALEPROOF. They know that with "X" they make three times the profit that they could by dismantling and welding.

And they wouldn't risk their reputation experimenting with an imitation.

"X" LABORATORIES

636 Washington St. Boston, Mass., U.S.A.

IN THE BUILDING

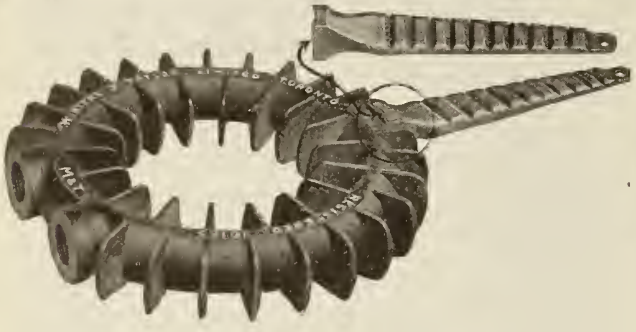


OR UNDER GROUND

ASK YOUR JOBBER FOR T.H.M. CO. BRAND OF SOIL PIPE AND FITTINGS.

TORONTO HARDWARE MFG. COMPANY, - Toronto, Canada

WE MANUFACTURE A FULL LINE OF HIGH-GRADE RANGE BOILERS



MORE HEAT!

This is our No. 15 Boiler Coil. Extreme dia. 13". Has a large heating surface allowing for a maximum efficiency. Very easily installed and lasts an unusual length of time.

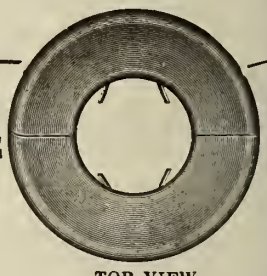
If your jobber cannot supply you write us direct.

McIntyre & Taylor Limited

Toronto Montreal Winnipeg

OPEN VIEW NO. 10-A

The CEILING PLATE that's better



TOP VIEW NO. 10-A

THE NO. 10—A NARROW FLANGE PLATE—IS A STEEL HINGED PLATE. FLANGES ¾" WIDE. HIGHLY FINISHED. ESPECIALLY DESIGNED FOR TWIN CONNECTION "NARROW."

Gem No. 4.

The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

High quality at the right price.

Gem No. 4 Automatic Air Valve

Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

Write for catalog showing our complete line of specialties.

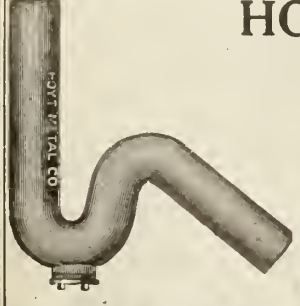
The BEATON & CADWELL MANUFACTURING Co.

New Britain, Conn.

Eastern Agent: J. R. Devereux & Co., 358 Beaver Hall Square, Montreal. Western Agent: A. E. Hinds & Co., Chamber of Commerce, Winnipeg.

HOYT METAL GOODS ARE KNOWN

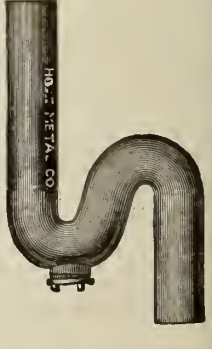
FROM COAST TO COAST



As time-savers there are none equal to our Wiping Solder, Bar or Wire Solder.

Hoyt Lead Traps, bends and waste pipe are in a class by themselves.

All our products are made to formula.



Our Mixed Metal Sales Amount To Over $5,000,000 Annually.

Write your Jobber

HOYT METAL COMPANY, TORONTO, ONTARIO

New York, N. Y., London, Eng., St. Louis, Mo.

WROUGHT PIPE

BLACK and GALVANIZED
SIZES, 1/8 IN. TO 4 IN.

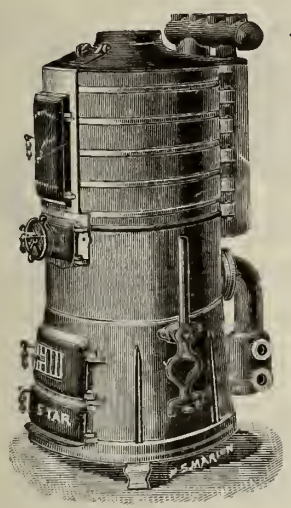
All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

All Sizes of NIPPLES (Black and Galvanized)

Ask your jobber for CT *Brand of Wrought Pipe*

CANADIAN TUBE & IRON CO., LIMITED, MONTREAL
Works: Lachine, Can.

Thousands of Star Boilers in Use requiring repair Parts



It will be a long time before folks forget the coal troubles of the last few seasons.

The principal feature of the Star Boiler is that **no other round hot water boiler has any coal-saving improvement not embodied in the "Star."**

Then, too, while boiler installation and repair time is here, why not stock up with Star parts, for which O. Belanger has taken over the rights and is now making?

Many thousands of Star Boilers are in use requiring these repair parts hitherto unobtainable.

Write to us at once in time to catch the season's business.

We guarantee prompt deliveries.

O. BELANGER, REG'D.
Amherst Street
MONTREAL

The Heart of the BV Vapour System

The BV Vapour Regulator will lift 25 lbs. on one ounce of pressure.

Territory for Sales Representatives

The BV Air Eliminator
Bottum Valve Company
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Have You Taken Down Your Sign?

A prominent merchant who has made a great success of all branches of his business has said that withdrawing advertising from a good trade paper is like taking down your sign. Advertising to the trade you serve is business insurance, but premiums must be kept up or the policy will lapse.

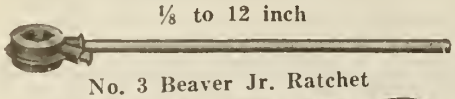
There never was a time when the trade was keener for business information. That is why the advertising pages of the SANITARY ENGINEER are being followed so closely at the present time.

GURNEY-OXFORD BOILERS RADIATORS
FOR HEATING ANY DESCRIPTION OF BUILDING BY STEAM OR HOT WATER
THE GURNEY FOUNDRY CO. LIMITED
TORONTO MONTREAL CALGARY WINNIPEG VANCOUVER

BEAVER TOOLS

For Easy Cutting

⅛ to 12 inch



No. 3 Beaver Jr. Ratchet

THE pipe-threading problem is readily solved when **Beaver Easy-Working Die Stocks** are used. They cut quicker and save labor, time and money.

They eliminate troublesome bushings and the bother of changing dies.

Beaver Threaders are easily adjusted. Simply "move the handle—that's all."

Beaver Tools are absolutely guaranteed. The user and the dealer are both protected.

Write us for descriptive circular and prices.

The Borden Canadian Company

110 Church St. - - - Toronto, Canada

GENUINE

ARMSTRONG STOCKS and DIES

Hinged Pipe Vises *Pipe Cutters*

Pipe Threading Machines

—MANUFACTURED BY—

THE ARMSTRONG MFG. Company

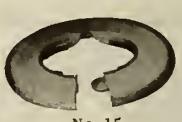
317 Knowlton Street
BRIDGEPORT, CONN

248 Canal Street
NEW YORK

"BC"

COMBINATION
COLD ROLLED STEEL
Floor and Ceiling
PLATES

Carried by the leading supply houses



No. 15

Puts just the right finish on that heating job

Send for catalog of complete line of "B. & C." goods.

No. 1 Valve

Stock carried by our Canadian Representative
W. H. CUNNINGHAM & CO.
183 Church Street
Toronto, Ont.

No. 16

The Beaton & Corbin Mfg., Co.
Southington, Conn., U.S.A.
The Old Original Company

No. 17

"HAUSE" PIPE JOINT CEMENT

For steam, water, air, oil, gas, gaskets, etc. The cement that cements. Sets like gum. Allows no leaks.

The Great Value of "HAUSE PIPE JOINT CEMENT" lies in its peculiar chemical properties which permits of its hardening and expanding after the joints are made up. In making up joints it has the same effect as a lubricant on the best graphite, and while the joints may be made and broken readily, a perfectly tight joint is maintained at all times. Comes in 1-lb., 5-lb., 15-lb., 25-lb., 50-lb. cans, 100-lb. barrels. Manufactured in ready mixed and powder form. Ask your jobber for prices, or write us direct.

Made in Omaha, Neb., U.S.A.,

Manufactured in Ready Mixed and Powder Form.

Canadian Distributors:

Empire Manufacturing Co., Limited

LONDON and TORONTO

WORTH WHILE PUBLICITY

The general tendency in Canada is towards selling high-grade goods. There never was a time, in the history of the country, when all branches of the Canadian trade were more interested in securing all possible information regarding products they can recommend and guarantee to their customers. Advertisers in SANITARY ENGINEER reach the cream of the trade in all parts of the Dominion.

The

Trade K—T Mark

K-T FOUNDRY

GALT ONT.

STANDARD

Soil Pipes and Fittings are of pleasing design and good finish. They look good and they **are good**

SPECIALS

Range Boiler Stands are adjustable to 30-35-40 gallon boilers, and you can connect directly under the boiler. Inexpensive but flawless.

Your jobber can supply our goods--if you ask for them

Pipe Fittings

Made in Canada

The Brand that has the Quality

M Brand Pipe Fittings, etc., give a service and satisfaction that will invariably get you re-orders and much new business as well.

A trial of the goods will prove this claim.

CAST IRON FITTINGS

With this brand mean fittings made with iron of high tensile strength—proper proportions and correct tappings.

RECESSED DRAINAGE FITTINGS

MALLEABLE FITTINGS

With this brand mean fittings made of Air Furnace Refined Iron, reamed and tapped to gauge with perfect threads

Standard and Extra Heavy Flanged Fittings and Flanges. Galvanizing Malleable and Gray Iron Castings of all Kinds.

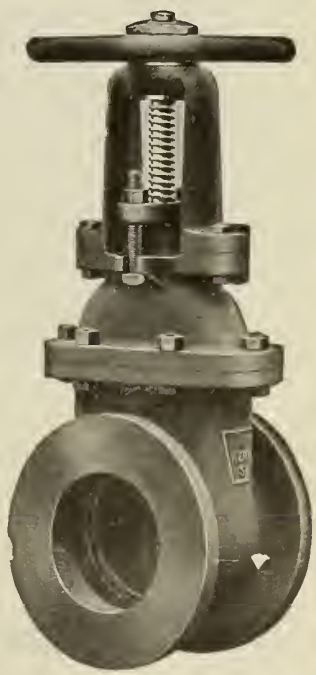
International Malleable Iron Co., Limited, Guelph, Ontario, Canada

There Are Lots of Gate Valves

Advertised and Sold

but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.

Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.

Approved by the Fire Underwriters' Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

EVERY FITTING TESTED

VITRO
NO TROUBLE

EVERY TANK GUARANTEED

No Lining,

No Joints, No Leaks

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Galt, Canada

Sanitary Engineer
Plumber and Steamfitter of Canada
VOL. XIII. PUBLICATION OFFICE, TORONTO, AUGUST 1, 1919 No. 15.

Empire Service

A new building season is opening up. After five years of more or less retrenchment in general building and construction work, the Canadian building trades are commencing to catch up on work that has been left undone—work laid aside for more pressing war duties.

This will impose many new problems on the plumbing, sanitary and heating interests, but here is where we offer our services—BESIDES SUPPLYING COMPLETE LINES OF PLUMBING, SANITARY AND HEATING EQUIPMENT, we send our engineers to assist you solve any complex problems that may confront you.

Your problems are our problems, too. It may be the equipment of a new building with the very latest types of plumbing and sanitary facilities. We can help you plan this work. It may be that a building must be refitted—a water pressure system may be needed, or heating facilities found necessary. We offer you expert advice, and can supply EVERY NEED.

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OFFICIAL BULLETIN

NUMBER TWO
OF

The Canadian Society of Domestic Sanitary and Heating Engineers

PRESIDENT	VICE-PRESIDENT	SECRETARY-TREASURER
Frank R. Maxwell, Toronto	Harry Mahoney, Guelph	Garrett F. Frankland, Toronto

To the Sanitary and Heating Craft throughout the Dominion of Canada:

AreYou a Member of the Above. If Not,Why Not?

MEMBERSHIP

The Canadian Society of Domestic Sanitary and Heating Engineers shall consist of representatives from Local and Provincial Societies, and individual members in cities and towns where no local or provincial society exists.

JOIN NOW

You owe yourself the honor of associating with those who are striving to raise the standard prevailing among the Sanitary and Heating Engineers of our Dominion.

To accomplish the above, we NEED YOUR ASSISTANCE and CO-OPERATION, so forward your Name and Business Address, with complete information to the SECRETARY at once

DO YOUR BIT, by getting in touch with your Local Competitor, and advise him to do likewise.

Watch this page in each issue, and remember our Motto:

ALL FOR ONE
and
ONE FOR ALL

Address all Correspondence to the Secretary.

GARRETT F. FRANKLAND,
Secretary-Treasurer
Room 303, No. 22 College Street, Toronto, Ontario

Yours for Co-operation,
FRANK R. MAXWELL,
President.

SANITARY ENGINEER, August 1, 1919, Vol. XIII., No. 15. Published 1st and 15th of every month at 143-153 University Ave., Toronto, by The MacLean Publishing Co., Ltd. Yearly subscription price, Canada, $1.00; United States, $1.50; Great Britain and the Colonies, 4s. 6d.; elsewhere, $2.00. Entered as second-class matter at the Post Office Department, Ottawa. Entered as second-class matter July 1st, 1912, at the Post Office at Buffalo under the Act of March 3rd, 1879.

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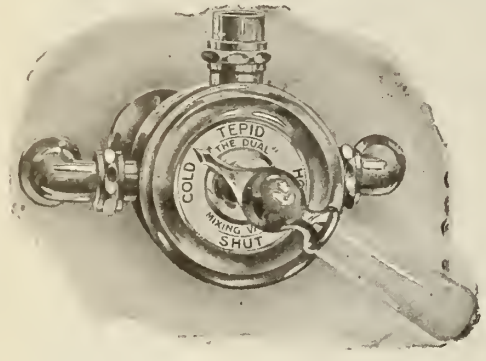

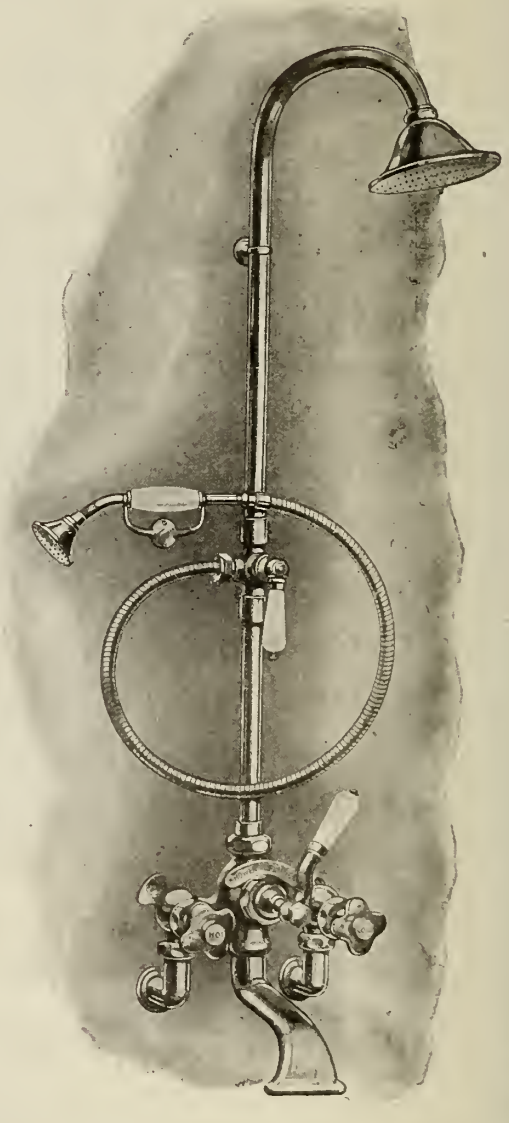

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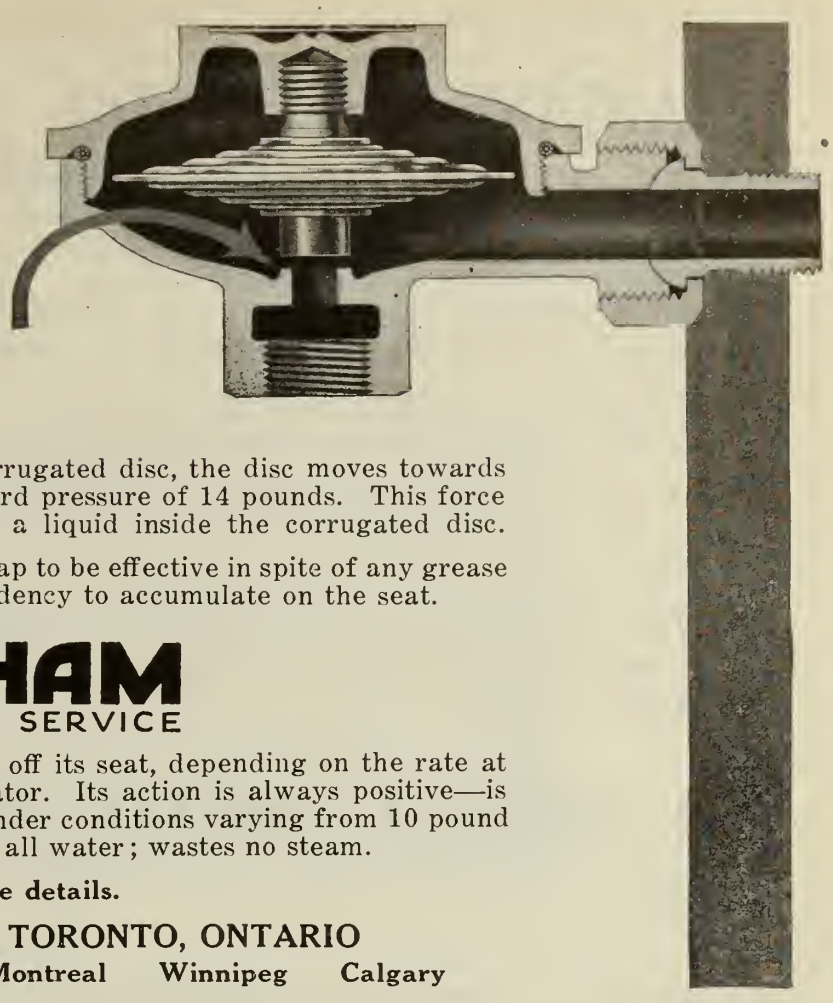

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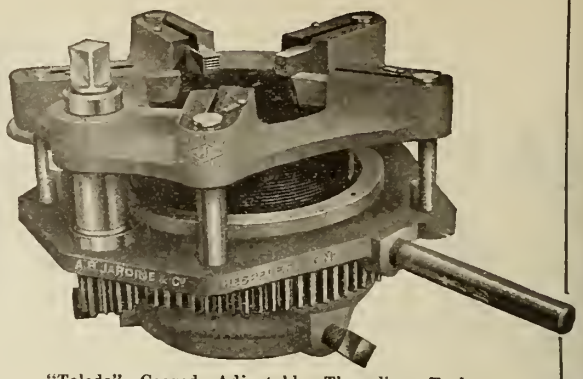

"Toledo" Geared Adjustable Threading Tool No. 2½. Capacity 2½ to 6 in. inclusive. Weight, 120 lbs.

THE ratchet feature of Jardine and Toledo Tools permits their being used to thread pipe which is already in place, no matter how awkward it may be to reach. The Jardine and Toledo have no cams or jim cracks to get out of order; and the dies only cut with the mouth of the cutter. Also, as the tool advances on the thread the dies open out so as to make the proper taper. This means there is no friction on the pipe and every ounce of strength is used in making the cut, so saving time and labor. These are only a few of the valuable features of these tools.

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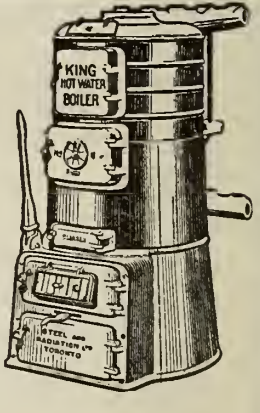

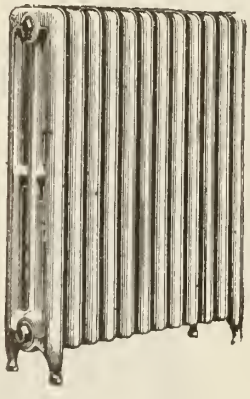

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"MADE IN CANADA"

The Secret of the Strikes

Most Canadians are asking "What is the cause of the 'Great Unrest' "? Is it the fault of labor—or of capital?—or is it the result of German propaganda? Do you know of the real reason for the labor disturbances in Canada, and elsewhere? Are YOU thoroughly familiar with the ins-and-outs of the plans which threaten a world-wide "tie-up?" This is something that should be understood by every Canadian. And every Canadian should read "The Secret of the Strikes," by Lieut.-Colonel J. B. Maclean in the August issue of MacLean's Magazine. It is brimful of startling and authoritative information regarding this great problem. Read it carefully. It starts on page 33, August MacLean's.

"The Lecturer At Large"

Stephen Leacock is one of the continent's greatest humorists. "The Lecturer at Large" is one of the best humorous sketches that he has written. It is made up of what he terms "a few painful reminiscences of the platform" in the course of his lecturing up and down Canada. Get your family around you and read the sketch aloud—it's a rare treat.

Other Big Features

"A Party in the Making." By J. K. Munro. Illustrated by William Casey. An article on the political situation, giving a great deal of inside information with reference to recent developments at Ottawa.

"Solving the Problem of the Arctic." By Vilhjalmur Stefansson. The fifth instalment of his story of the five years' explorations that he conducted for the Dominion of Canada.

"The Unspoiled Country." By Harold C. Lowrey. A descriptive article of a part of Canada which is little known to Canadians generally, Temagami.

"Petite Simunde." By Arthur Beverley Baxter. Illustrated by E. J. Dinsmore. A charming romance of the war. The author will be remembered favorably for his "Mr. Craighouse of New York, Satirist."

"The Seven Blue Doves." By W. A. Fraser. Illustrated by Charles L. Wrenn. The fifth of the Bulldog Carney series and in some respects the best. It is a mystery story.

"His Majesty's Well-Beloved." By Baroness Orczy. Illustrated by C. F. Peters. The second instalment of this splendid romantic novel of the colorful era of Charles II.

The Month's Vital Question

Turn to page 34, August MACLEAN'S, and you will find timely and interesting information regarding the High Cost of Living—a problem of large proportions.

The Review of Reviews

Here are a few of the articles chosen as the best published during the past month in all magazines:—Britain Winning Supremacy of the Air; Has Japan Two Governments?; Kaiser Employed Famous Beauties; The New Triple Alliance; Mammoth Animals in Alberta.

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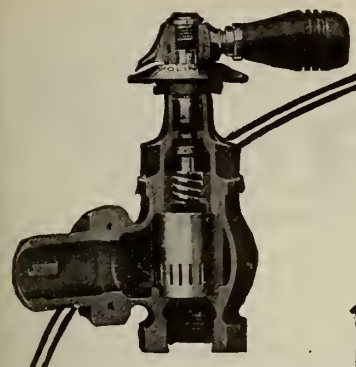

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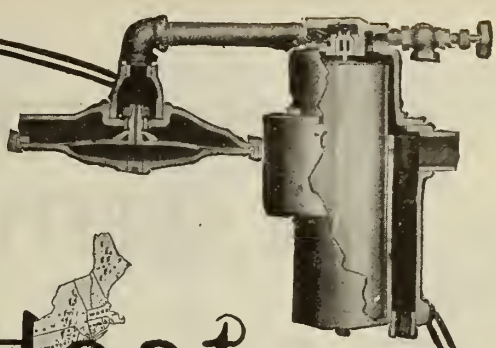

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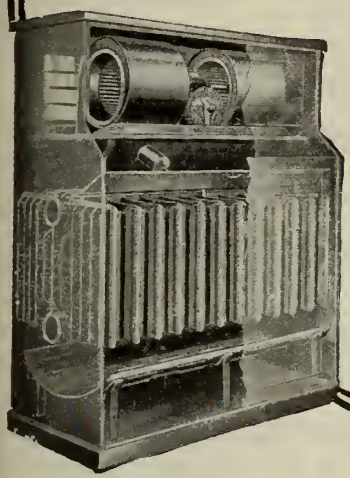

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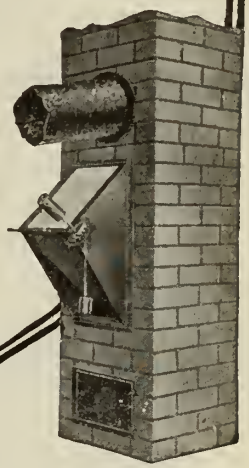

ANOTHER STEP IN EVOLUTION

A New Milestone is Erected on the Line of Canada's March of Progress

The high and increasing cost of fuel is met by getting more service out of the heat units; more direct results from each pound of coal, or foot of gas.

The problems of **cooking** and **heating** in the home are combined and **SOLVED TOGETHER.**

THE SOLUTION IS THE VICTORY HOT WATER HEATER—something absolutely new and unique. This wonderful heater is suited to the modest cotttage of the workingman or the pretentious residences of the wealthy. It brings the luxury of Hot Water Heating within the reach of every householder.

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"LIVING BETTER" and "A BETTER LIVING"

A Little "Straight Talk" to the Canadian Plumbing Trade

LIFE IN CANADA TO-DAY contains possibilities unheard of by former generations in this or any other country. Studies in comparison of opportunity in different countries bring the student back every time to the pointed fact that **CANADA** right now offers vastly more advantages to the ambitious man than can be found under any other flag.

CONDITIONS IN THE HOMES OF THE PEOPLE touch the very root of national life and prosperity. Looking backward a brief space of twenty years in any community in Canada, what wonderful differences are apparent in methods of sanitation and heating. By this one gauge, probably more than by any other, can be measured the advance of vital elements which daily and hourly affect the life. health and happiness of the individuals who make up the nation.

THE TEACHER, THE BANKER AND THE PLUMBER have all had the closest association with this progress of civilization, and we speak no flattery, but merely assert an evident truth in stating that of these the **PLUMBER** has been called upon for as much exercise of heart and brain as has any of the others. Not alone in equipping new residences, factories and other buildings has the **HEATING AND SANITARY** expert been of vital necessity, but his services are even more urgently required in removing out-of-date equipment from older or already built houses and places of business, and replacing these by modern installations which mean so much in the movement toward **"LIVING BETTER."**

OPPORTUNITY KNOCKS AT THIS DOOR. She calls the modest plumber in every Canadian town or city to a high ideal of **SERVICE.** Where the Canadian plumber gives his **OPPORTUNITY** enthusiastic welcome and moves forward to assist in the great movement for health and comfort, he can be assured with certainty of **"A BETTER LIVING."** If he combines with **SERVICE** the high elements of "Efficiency" and "Quality," there can be hardly any limit to his possibilities.

"QUALITY," "EFFICIENCY" and **"SERVICE"** together form the motto of the CANADIAN BRASS COMPANY. This firm strives constantly to assist the Canadian plumber toward solving his problems and supplying his needs so that the utmost of satisfaction in every particular may result.

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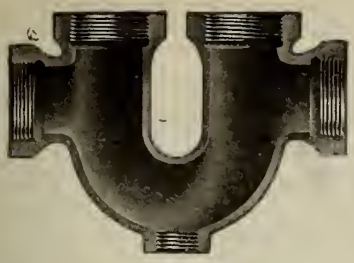
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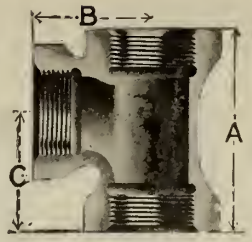

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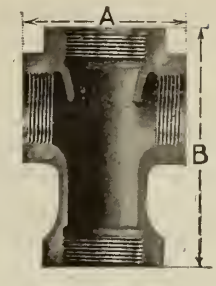

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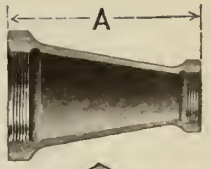

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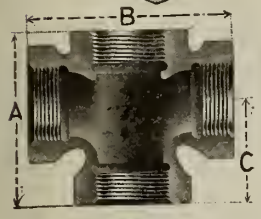

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32

Cast Iron Drainage Fittings

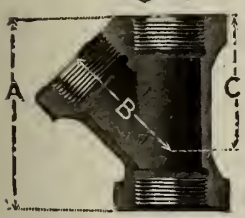
Design.—These Fittings are specially designed for sanitary plumbing for use with wrought pipe. They are made with a shoulder which engages flush with the pipe, thus ensuring a free continuous flow as the inside diameter of the Fittings and pipe are the same—see cuts. Fittings are tapped pitched to give a flow of ¼" to the foot.

Uses.—1. Drainage Fittings and wrought pipe make a most desirable substitute for Cast Iron Soil Pipe and Fittings for sanitary installations.

2. For vacuum cleaning systems and sprinkler installations they can be utilized advantageously as an unobstructed flow is assured.

3. Drainage Fittings can be used in place of the regular Long Sweep Fittings as they are made in both long and short sweep and can be tapped pitched or straight.

Advantage.—The improved appearance and decided benefits derived from any system having all screwed joints instead of caulked joints will be readily appreciated. Considerable time is also saved in making connections and in many cases screwed joints can be made quite easily in positions where caulking would be most difficult.



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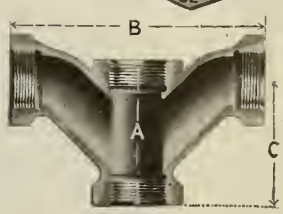

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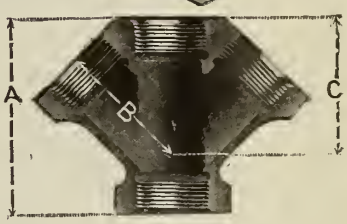

24

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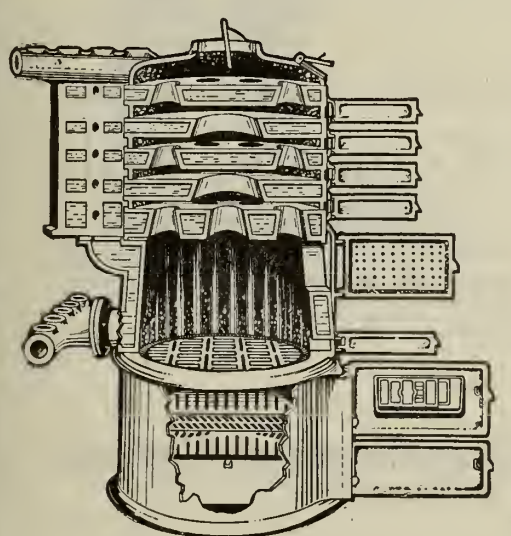

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Write us to-day. You will be interested. The facts are that the "Sovereign" gives a uniformly high average of satisfaction wherever installed, and the figures give equal satisfaction to the engineer.

People everywhere are counting the coal cost of heating. That is where the "Sovereign" makes a strong appeal. It is built to save waste in every detail of design. The "Sovereign" is the most convincing hot water boiler on the market. Its performance is always well up to the best expectations.

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SANITARY ENGINEER

PLUMBER AND STEAMFITTER OF CANADA

ESTABLISHED 1907 PUBLISHED TWICE MONTHLY

Vol. XIII. TORONTO, AUGUST 1, 1919 No. 15

CONTENTS

McFall Allegations Stir Up Trade 13-15
Are You in Business For Fun or Profit? 15-16
English and American Water Softness 17-19
Burning Steam Sizes of Anthracite 20-21
Editorial Comment 22-23
Toronto Society Picnic at Island 24-25
News From Here and There 26-27
Montreal Plans Closer Supervision of Plumbers' Licenses 27
Heating and Ventilating—Steam 28-29
Ventilating the Modern School 29-30
Practical Sheet Metal Work 31-32
Test Case May be Made Out of Charge Laid at Brantford 33
No Exclusive Report Issued 33
The Markets at a Glance 34
Market Conditions and Tendencies 34-36

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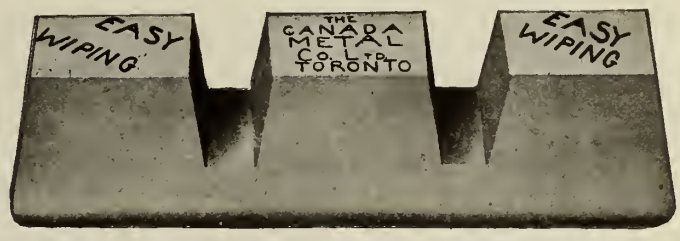

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TORONTO

Advertising Plumbing Material

One of the most successful Advertising Campaigns of Plumbers' material was conducted by a firm in the United States manufacturing a Plumbing Specialty, and much of its success can be attributed to the fact that it appealed to the public principally through the Master Plumbers.

Plumbing is one of the very Trades in the Building Industry where the services of an expert workman are necessary for the proper operation of the fixtures used in the installation. No matter how good the fixtures are they never give satisfaction unless they are properly installed.

An Advertising Campaign, to be successful, must therefore have as a basis a thorough understanding and perfect harmony between the Manufacturer, the Jobber, the Contractor and the Consumer, and any effort to interest the general public that does not take all these factors into consideration cannot be successful in the fullest sense of the word.

Our Company is engaged in the manufacture of Plumbers' enamelware. Naturally our first thought is to interest the Plumber and the General Public to the advantages of using PORT HOPE enamelware; but our interest does not stop there. We recognize that we must go further than that if we expect to obtain results, and assist in taking part in every enterprise that will extend, promote and develop the sale and general use of more sanitary fixtures. Nobody, these days, doubts the efficacy of Advertising, but there are many ways of Advertising and perhaps one of the best is that method suggested by a Master Plumber, who said that advertising of Plumbing material should be general in its application and educational in its character.

The Public want to know more about sanitary fixtures, their manifold uses and above all their proper cost. The lack of proper publicity prevents thousands in the rural districts from enjoying the comfort of modern Bathrooms, and in urban districts from renewing and replacing old and worn-out sanitary fixtures.

It is not the intention of the writer to suggest any particular method, but it is a question which should be carefully considered from the Manufacturer's and Plumber's point of view, and should, properly speaking, be one of the subjects which should engage the attention of every Master Plumbers' Association.

It is quite certain, however, that an expenditure of say One Hundred Thousand Dollars a year spent in an Advertising Campaign with copy intelligently directed and properly prepared, would produce results that would pay subscribers many times over the amount of their subscription, and in Canada that would only mean a contribution of about Forty Dollars a year from each man engaged in the business.

To the actual profit in cash must be added the real value that would come from the "Get-Together" idea. Not only would the public be educated, but the Manufacturer and the Plumber would get better acquainted, and by a proper understanding of requirements there would be a concentration of ideas, a standardization of patterns and equipment, a greater demand for Plumbing material, a lower cost as a result of larger productions, and generally a satisfaction which would make it a real pleasure to do business.

We would like to help in the good work.

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ROYAL BANK BUILDING, TORONTO
MONTREAL SHOWROOMS
234 Beaver Hall Hill

Established 1907 Circulates Throughout Canada

Sanitary Engineer
Plumber and Steamfitter of Canada

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McFall Allegations Stir Up Trade

Probe Welcomed in Some Quarters—Others Say There is Nothing to It—Statement by Jas. Hardy, Secretary of Association

NOT for a long time has more interest been taken in the trade in charges made at Ottawa than in the allegations made by Dr. McFall, the Cost of Living Commissioner, that a combine is responsible for advancing prices of all kinds of sanitary and plumbing supplies. Suitable action, Dr. McFall states, has been recommended, and this is taken to mean that an investigation is likely.

Close inquiry made by SANITARY ENGINEER among those in the trade shows that an investigation into the prices they are being charged for goods would be very warmly welcomed.

The views expressed by Frank R. Maxwell, president of the Dominion Society of Domestic, Sanitary and Heating Engineers, reflect those of many members of the trade:

Would Welcome Probe

"I know I am voicing the views of the members of the association and the men in the trade all over the country," said Mr. Maxwell to SANITARY ENGINEER, "when I say that the installers would welcome an investigation. We will give every assistance we can in clearing up this matter. To my mind there is no doubt that there is profiteering somewhere. I will be glad if the manufacturers and jobbers can prove themselves clean, but I do not know how they can.

"The men who are doing the installing, and the men who work for them are not getting the profits. I wish they would come to my shop and investigate. My books and my shop are open to anyone who is interested. The same will apply —I think—to all in the trade. The man who is a genuine man and not a shark is not getting more than he is entitled to. Any fair-minded person will admit that the installer is entitled to a fair profit on his work and our books will show that that is all we are getting, in fact some of the men are not getting what they are entitled to."

Cites Some Instances.

As an instance of how prices have jumped Mr. Maxwell cited range boilers. Before the war, he said, they could be purchased by the trade at $3.75. Now they are costing more than $11.

"Is there any justification for this?" said Mr. Maxwell. "Take enamelware, which advanced recently, as another case. Is there any real reason why this advance should be made? The manufacturers may say that labor costs are to blame. That is a favorite plan just now to answer high prices or increases in prices. The manufacturers have not advanced wages anything like they have advanced the cost of goods and in many lines they have not had to advance wages at all, as the men are out on strike, and goods that are being sold now at high prices were made months ago at wage scales prevailing at that time.

Too Many Profits

"There are too many profits before the goods get to the retailer," said Mr. Maxwell. "There are too many commission houses each getting its percentage. Another reason that makes prices high is that the jobbers encourage piecemeal buying instead of buying in bulk because they make a lot more money selling in that way. The method of delivery is another factor in making goods cost more. I am a firm believer in every master plumber having goods delivered to his own shop. As things are now you can call up a firm and have stuff delivered to any part of the city. This all costs money. I know of one jobbing firm in Toronto whose cartage costs each year are close to $10,000.

Another Big Saving

"If each master plumber had the goods delivered to his shop it would make for a saving in another way also. When work was being started on a job all the material would be assembled and the plumbers when they went to the job could go right ahead. Now they frequently have to wait until some material is delivered. Even if only a man and a boy are kept waiting it does not take long for half an hour to roll around and that means 75 cents. There is too much time wasted altogether by the present plan and it has to be paid for."

Mr. Maxwell also complained of the methods followed by the jobbing houses in granting credit. Anyone can get unlimited credit, he stated, if the builder goes security. As a result, he says, there are big losses often and these have to be made up.

Must Learn Business

"The jobbers," said Mr. Maxwell, "should deal with this question of granting credit in a proper way. A man should be made to learn to finance his first job instead of getting somebody else to do it for him. It will make him a better business man and will start him in the right way of conducting his business."

Another injustice pointed out by Mr. Maxwell was the placing of some firms on the jobbers' list because they bought in quantity. He explained that if a firm went in and bought a large quantity of goods for immediate reqirements it was entitled to a reduction, but this plan, he alleges, is not followed. Because some firms who buy a lot of goods spread their purchase over a year, taking the goods as they need them, is no reason why they should be shown a preference over others in the trade, he says. Nearly all the small shops, he stated, buy through the jobbers.

Production Limited.

Mr. Maxwell declared that in his opinion production is being limited because of manipulation.

"What we need," he said, "is more production, but will we get it? Will any manufacturer or anybody else produce twice as much for his present output as he could for twice as much? The way prices are being raised on everything just makes a circle which hits everything. If you get more money and have to pay more money for everything, all we are doing is to exchange money. Take foodstuffs, for instance. Is there any reason for the prices things are? Probably never in our history has there been so much garden stuff raised. During the war people learned to grow a lot of the things they needed and there are thousands of gardens to-day that were not in existence a couple of years ago. But was foodstuff ever higher? I say it is a hold-up, purely and simply a hold-up,

and the cold storage firms are to blame for some of it.

Up to the Government

"In my opinion the solution lies in the Government taking action to make the cold storages put the goods they have on the market in a reasonable time. At present the cold storage firms buy up all the stuff and it reaches the consumer just when the cold storage owner feels like releasing it. If he knew he had to put these goods on the market in, say, thirty days, he would sell it for a lot less than if he is allowed to carry it for months. I believe there are a lot of firms who will deliberately let foodstuffs spoil rather that sell it at a little lower price."

Statement by James Hardy

James Hardy, of Jenkins & Hardy, when asked for a statement regarding the allegations of Dr. McFall, declared that there was no jobbers' association. There had been one, but at a meeting held on November 21, 1916, it became non-existent as the result of a resolution passed, and it was decided that its interests would be looked after by an association, of which Mr. Hardy is secretary.

Mr. Hardy was asked if it were correct that a few weeks ago the association had its agreement considered by a solicitor and changes made to make it legal. Mr. Hardy stated that what really occurred was that it came to the notice of the association that certain jobbers were allowing an advantage of ten per cent. to certain men in the trade. This matter was taken up with Mr. Johnston, the legal adviser, and it was suggested that this was not the proper thing for the jobbers to do. Mr. Johnson agreed with this view and as a result a letter was sent to the jobbers advising them that all those in the trade must be placed on an equal footing, and no ten per cent. advantage or any advantage allowed to anyone.

Fear No Investigation

Mr. Hardy stated that the manufacturers were in no way concerned with the allegations of Dr. McFall and that there was no need of making any statement on their behalf. If they were called to testify at any investigation that might take place their books would show that they had not been making exorbitant profits.

Mr. Hardy stated that he thought Dr. McFall's action was somewhat high-handed and that as far as he was aware Dr. McFall had not in any way made any effort to secure information from the manufacturers or jobbers.

"Does he think he is going to put all these firms out of business by making statements of this kind," said Mr. Hardy. "It looks to me as if, perhaps, he is going after some office and wants to bring his name before the public and make a big man of himself."

Asked if business had been good lately, Mr. Hardy said: "It has been good and will be all right if some fool does not go and spill things."

Makes No Statement

Asked to give an official statement for publication to the trade, Mr. Hardy said all that it was necessary to say was that there was no jobbers' association. Pressed further for a statement he said he would prefer to consult Mr. Johnston, the lawyer, and tried without success to get Mr. Johnston on the telephone.

One manufacturer declared that no one in the trade had been responsible, in his opinion, for having started any move for an investigation at Ottawa. On being told that some of the sanitary engineers said they would welcome a probe into prices they were being charged, this manufacturer said that he did not believe it and added that the plumbers themselves were charging the public high prices compared with what they bought the goods for.

Comments in the Daily Press Harmful to the Trade

A great many comments have been appearing in the daily press regarding the statements of Dr. McFall and many of them are harmful to all branches of the trade. The following are typical views expressed in news and editorial columns and indicate the attitude that is being encouraged in the minds of the public.

Under the heading "Robbery Less Offensive Than Plumbers' Methods," the Toronto Telegram says:

"The report of Dr. McFall, Dominion Cost of Living Commissioner, intimating that a combine, international in its scope, is enhancing the prices of all kinds of sanitary and plumbing supplies, the jobbers, through whose hands the trade is forced, sometimes taking as high as 25 per cent. for themselves, had little news in it for J. Walter Curry, K.C., who prosecuted the combines in Toronto fourteen years ago. Dr. McFall optimistically recommends 'suitable action.' Mr. Curry says that his prosecutions failed to quash the combines because of lack of sympathy 'higher up.'

"'The evidence in those prosecutions showed that the combines were international in their scope then, and I have no doubt they have been ever since,' said Mr. Curry this morning.

"He stated that those convicted had been fined, and had paid their fines.

No Support

"'The prosecution did not quash the combines?' he was asked.

"'How could they?' he asked. 'How could the prosecutions quash the combines when there was no sympathy behind me, no support in the prosecutions, and when the cases went to the courts on the other side there was no sympathy. There was nothing to do but to resign.'

"'Was that the cause of your resignation?'

"'Yes.'

"In June, 1908, Mr. Curry publicly declared that combines were extorting from the people of the province $3,000,000 a year. The late Hon. J. J. Foy, then Attorney-General, in reply suggested that a number of the combines originated in the Province of Quebec, and that the Attorney-General of that province should be approached. Mr. Foy said that a number of combines were in the hands of counsel; in connection with the alleged tack combine, he had been advised by eminent counsel that it would be impossible to secure a conviction.

Tarred With Same Brush

"Mr. Curry got just as little sympathy from his political friends when he was one of a deputation that called on Hon. W. S. Fielding in Ottawa. Mr. Curry stated on that occasion that, while Crown Attorney in Toronto, evidence was brought before him which showed the existence of 100 trade combines in Ontario, which collected millions of dollars yearly in unjust profits. He asked for a special officer to prosecute combines, and was told by the Liberal Minister that many difficulties stood in the way, and it had been decided to leave the matter in the hands of the Crown authorities of the various provinces. Remedy could be had under the Criminal Code.

Prosecuted

"In October, 1905, the Attorney-General of Ontario prosecuted the Master Plumbers and Steam Fitters' Co-operative Association. They were charged with stoppage of supplies, checking of trade, prevention of manufacture and control of prices. On November 14, after the full examination of papers and records seized at the headquarters of the two organizations, some eighteen master plumbers were arraigned under the instructions from the Attorney-General on a charge of conspiracy, and during the trial it was found that $20,000 had been distributed among the members as a result of certain combine arrangements, while newspapers stated that prices in the city were double what they were when the combine started operations.

Imposed Fines

"Justice Clute, on December 7, imposed a fine of $5,000 on each of the indicted associations, and individual fines ranging from $250 to $500 on eight master plumbers. In his judgment Justice Clute said that they took from the public money to which they had no possible claim. Of the two offences he thought robbery the least offensive. He found that the organization, while not affiliated with the United States' association, was in such close touch with it that it was able to secure assistance there at any time, either in keeping out good or in any other way.

"Dr. McFall, in his report given at Ottawa yesterday, says: 'At this time, when the excessive prices of building materials are working such hardship, the activities of this combine are particularly pernicious.'

"It is intimated that the combine is international in its scope, and includes both manufacturers and jobbers. The Commissioner says that 'by means of this combine practically all plumbing supplies are forced to go through the hands of jobbers, who frequently take as much as 25 per cent. or even higher for themselves, in spite of the fact that the plumbing trade, which is now attempting to free itself from this burden, considers the jobbers to be an unnecessary factor in the trade.

"'Cumulative evidence obtained over a protracted period is indicative of similar conditions prevailing in many other lines. Infractions of the law have been disclosed in the matter of articles of clothing and some of the most important foodstuffs, as well as less vital articles in domestic consumption.

"'Cases have also been prepared to prevent unfair trade practices, which are being exercised to forestall the operation of measures which would greatly reduce the cost of living. Suitable action,' said Dr. McFall, in conclusion, 'on these cases has been recommended.'

300 Per Cent. Profit

"A west end plumbing man, who does a lot of general contracting, told the Telegram that Dr. McFall's report hardly scratched the intolerable conditions under which the 'plumbers' trust of Canada' operates. He said that the combine in plumbers' supplies

was the tightest on the continent, and the 'trust' had every point in Canada down to such a system that advances of 300 per cent. had been made in many lines during the past two years.

"'Bath tubs we got three years ago for $14.50 we now pay $42 for. Kitchen boilers cost in 1916 $4.25; they are now sold at $17.75,' he said."

The Toronto Globe says editorially:

Combines, but Who Cares?

"The Canadian people will hear with more cynicism than surprise the charge of the Cost of Living Commissioner, Dr. McFall, that a combine is advancing prices in all kinds of sanitary and plumbing supplies.

"'Cumulative evidence obtained over a protracted period is indicative of similar conditons prevailing in many other lines,' adds Dr. McFall. This is not a revelation. The people have long known it to be true. The authorities upon whom the duty rests of enforcing the law against combines have long known it to be true. The only novelty is the fact that a public official says it is true. Years ago a certain Crown Attorney in Ontario showed a similar curiosity, and actually proposed to turn the searchlight of a public trial on a number of concerns indicted as combinations in restraint of trade, but the Ontario Government rebuked his zeal, and a long peace ensued. Nothing could disturb the Seven Sleepers at Queen's Park, and the Attorney-General was the most somnolent of all. Even judgments of the Bench that the Criminal Code had been violated did not wake him up.

"The Federal Government has the power to reduce the tariff when a combine shelters itself behind customs duties, but some person with a grievance must take the initiative, and he may hesitate to incur the enmity of a powerful combination if he is in the same trade. A Provincial Attorney-General requires no private complainant. If he suspects the law is being broken it is his duty to try to collect evidence. If he has evidence he is untrue to his trust if he refrains from prosecution. The constant war-

Continued on page 19.

Are You in Business for Fun or Profit?

Good Money to Be Made Out of Handling Electrical Fixtures and Utilities Along With Plumbing Goods, Says E. S. Coppins, of Woodstock, Ont.—Says Plumbers Must Work Together to Improve Conditions Generally.

Based on an interview by C. E. PARSONS, of Sanitary Engineer, with E. S. Coppins, of Woodstock, Ont.

WHEN Woodstock, Ont., became the distributing centre from which hydro power lines were built into many of the rural sections an opportunity was presented for handling electrical goods and supplies that is perhaps one of the best in the province. E. S. Coppins, plumber, was one of the first to see the chances and to take advantage of them. The Woodstock field is an especially attractive one, because of the large number of big milk factories centred in it. This means that thousands of farms are engaged in dairying that every morning they haul all the milk they can secure to the factories and that they get paid regularly and at good prices for it. It is one of the richest dairying sections in the province of Ontario, and the farmers are not only prosperous, but up-to-date. It is said that there are more fine dairy barns, lighted throughout by electricity, in Oxford county than in any similar area in Canada Some of the farmers have gone a step further. They have installed electrical milking equipment. While they were fixing up their dairy barns in this manner, they did not neglect their homes, and as fast as the power lines were completed they connected up with them, installing electric lights and doing as much work as they could by electricity.

Right After Business

All this progress meant some mighty good business for the merchants who went after it. Mr. Coppins was one of the first to start cashing in. He has always worked along certain definite lines in regard to his shop. One of his principles is that there is no better way of selling goods than by showing them. Another is that all goods and the store and shop be kept neat and attractive always. There are in Woodstock's business section some very attractive and well arranged display windows, but not many of them carry a broader appeal to prospective buyers, especially those wanting electrical or plumbing equipment, than that of Mr. Coppins'. His window display is changed every week, and he aims to continually keep an attractive showing of really serviceable goods before the people. He keeps his window shining, makes the most of the natural attraction electrical lines have for display purposes and always has a good variety designed to carry a wide interest. In doing this he has in view both the city and country trade. The farmers are in town in great numbers on some days, and Mr. Coppins always keeps something in his windows that will interest not only the farmer, but his wife.

View of a window display of electrical fixtures and household appliances recently put in by E. S. Coppins, Woodstock, Ont., from which excellent results were obtained. The arrangement is neat and decidedly attractive.

Brings the Business

"I have no better selling force than my show window," said Mr. Coppins to SANITARY ENGINEER. "It brings excellent results and brings them continually. People come right into the store and ask about the lines we show. Very often it will be some farmer or his wife who wants to find out about some electrical goods. Maybe they live a dozen miles out and are planning to remodel their home, or to install some piece of labor-saving equipment. The next caller may be a city woman who wants to know

General view of the interior of the display rooms of E. S. Coppins, Woodstock, Ont. The use of tables for the display of electrical household appliances, table lamps and bathroom fittings has been found very effective. To the left, counter display cases are well used. In set is the genial proprietor himself.

about an electric washer or an electric stove. And so they come. We get a lot of business that is directly traceable to the show window."

The same idea regarding display is carried out by Mr. Coppins in his store arrangement. He believes thoroughly not only in carrying a quality stock, but in letting people see what he has. Electric lamps, for instance, are shown not only on neat display tables, but at conspicuous points around the store, where they are certain not only to attract attention, but show to advantage. On another table may be seen electric irons, toasters, and other lines. At other points in the store there are displays of bathroom fixtures, electric stoves, gas heaters and other lines in which those who want to improve their homes are interested.

Get Splendid Results

"We get splendid results from our display tables and from our store display," said Mr. Coppins. "People will often come in to look at plumbing goods or see about electrical fixtures and get interested in an electric stove, an electric washer or some other goods. I have found from experience that it pays to keep one's stock out where people can look it over, and ask about it, and also to keep it looking its best. People like to look at new goods. If they pick up anything that is dusty or mussy-looking very often they get the idea that it has been in stock for a long time, and must be a poor seller, and lose their interest in it. I do a big country trade, and I find the farmers of this whole district are right up-to-date. They want the best there is and they are willing to pay for it. They are continually making improvements that will make their homes more comfortable or that will lighten their work. There is a lot of really good business in handling electrical fixtures and electrical utilities. Many of these lines practically sell themselves. People are interested in them right from the start, because they have either read about what they will do, have seen them in operation at some neighbor's, or have been told by somebody how much time and labor they will save. Take electric irons, for instance. No woman who has ever worked with an electric iron wants to be bothered ironing the old way.

Others Want Them

"The farmer's wife who has an electric iron or a washer or some other device never tires about telling her neighbors about it," continued Mr. Coppins. "They come over and see the article work. They can see that it saves them time and real drudgery, and naturally they are never satisfied until they get one. When they get an iron they want a washer, when they get a washer they want a cleaner or some other labor-saver, and so on. All this means good business for the dealer. I have found that handling these lines works in splendidly with my general plumbing business. There are sometimes slack seasons in plumbing. If I did not have the store business to help out I might often lose a good deal of money through being unemployed, through no fault of my own. Now, if I am not busy plumbing, there is always something doing in the store. All these lines carry a good profit, and as I would have to have the shop anyway, for my plumbing business, they cut down my overhead and give me a chance to make some money.

Little Co-operation

"One of the troubles with the plumbers," stated Mr. Coppins, "is that they will not work together. There are too many of them cutting prices, and they often end up by discovering that they have worked hard and not made any money. If they would work together they could get results and better conditions that need improving. Take for instance, the matter of the wholesales selling direct to farmers. They do this right along. If the plumbers of this district stood together and would not buy from the firms that sell to farmers and others it would not be long before the wholesalers would stop it. The plumbers should work together for their own protection. Here in Woodstock there is nothing to prevent an outsider coming in and taking a contract. If we stood together and worked for it, we could go to the council and do as they have done in some other cities, get a by-law passed making it necessary for any outsider to pay a license before he could take local work. While this might not stop the outsider altogether, it would at least help keeping them out, and it would show that we were a force in the community, and watching our own interests.

Better Conditions

"The plumbers not only of Woodstock, but of all Ontario and of all Canada," continued Mr. Coppins, "should work together for a standard plumbing code. All plumbing should be installed under a code of this kind. It would make for better

(Continued on page 19)

English and American Water Softeners

A Description of Several Types of Water Softeners From Which a Good Understanding of Their Operation May be Obtained—The Article Describes Several Types

By F. C. P.

THE accompanying drawings, Figs. 1, 2 and 3, show the carburetor of Wright's improved water softeners, developed from the designs of Player and Weddell at Tipton, England. The drawings, Figs. 2 and 3, show the details of the automatic gear and trip gear of this English water softener, considering the automatic inlet valve "A," Fig. 2. The float rod is adjusted so that the water is cut off below the overflow level. The dividing box "B," is set level so that the water flows over it in a film of uniform thickness. It divides the water into two or more parts. The division is controlled by an adjustable slide, "C," so that any amount of water can be caused to flow through the wheel. This is what controls the exact proportion of re-agent passing into the softener.

It will be noted that the water wheel, "D," is mounted on ball bearings, "E," which are kept well packed with grease. There are two chains and wheels,"F"and "G," one on either end of the shaft. One of these is geared to a chain wheel driving the stirrers, "H," in the re-agent tank, which keeps the mixture stirred. The other chain wheel is geared to drive a bevel gear.

The re-agent supply measure, "J," is clearly shown; the water wheel, "D," gradually lowers the re-agent supply pipe by means of the screw, "K," and allows the mixture of lime and soda to overflow in proportion to the quantity of water entering the plant. The bevel pinion, which operates this screw gear, slides on the spindle and is controlled by the position of the trip gear as shown on drawing, Fig. 3. As the screw lowers, the trip gear comes into operation at a certain point, withdrawing the pinion from the bevel wheel, so that when this has been withdrawn the water wheel no longer operates the screw. This should be adjusted by means of the nut, "L," so that the pinion is withdrawn before the bottom bracket "M" comes into contact with the agitators, and also before the long screw, "N," has been unwound off the nut, "O." When the overflow pipe has reached this point it is very near the bottom of the tank, and it is time to recharge it.

In charging, the first thing to do is to wind the screw by the handle provided, so as to lift the overflow pipe to the top of the tank. During this time the pinion is held out of gear as it will be impossible to wind against the water wheel. The oil lever is examined, and it will be noticed that the screwed spindle, "N," is hollow. When the screw is at the top of the tank, it is filled with oil to the top of the spindle by pouring oil down the hollow shaft. In starting the plant to work a definite number of pounds of lime and soda per inch deep in the re-agent tank is determined upon. The lime and soda are weighed and placed in the lime-slaking box, and sufficient water added to dissolve the soda and make a thin limewash, which is passed through the strainer, down into the re-agent supply tank, and the latter is filled to the necessary level with water, to produce the standard solution. The overflow pipe is then lowered until the re-agent is just commencing to overflow, when the water is turned on again and the plant is put into ordinary work.

The bottoms and bits of lime which pass into the re-agent with the charge

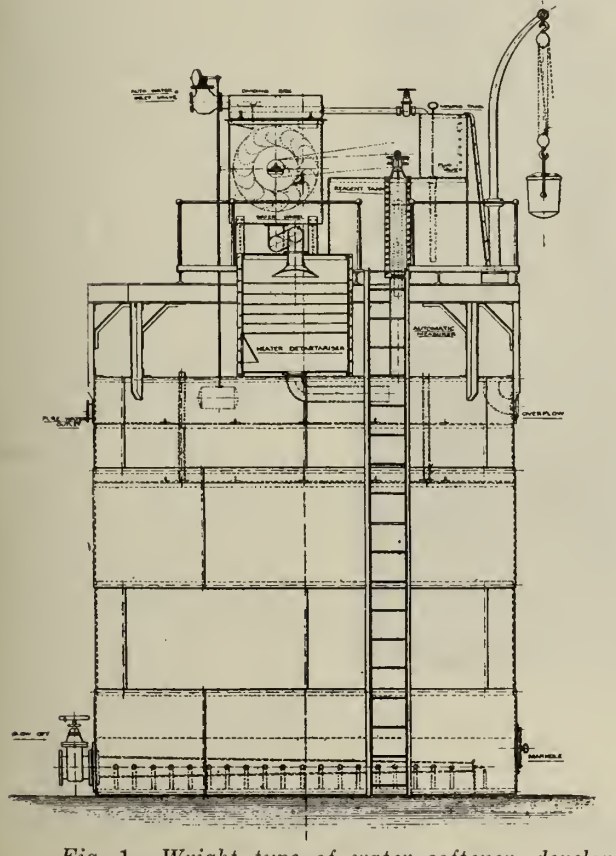


Fig. 1.—Wright type of water softener, developed at Tipton, England.

DETAIL OF AUTOMATIC GEAR.

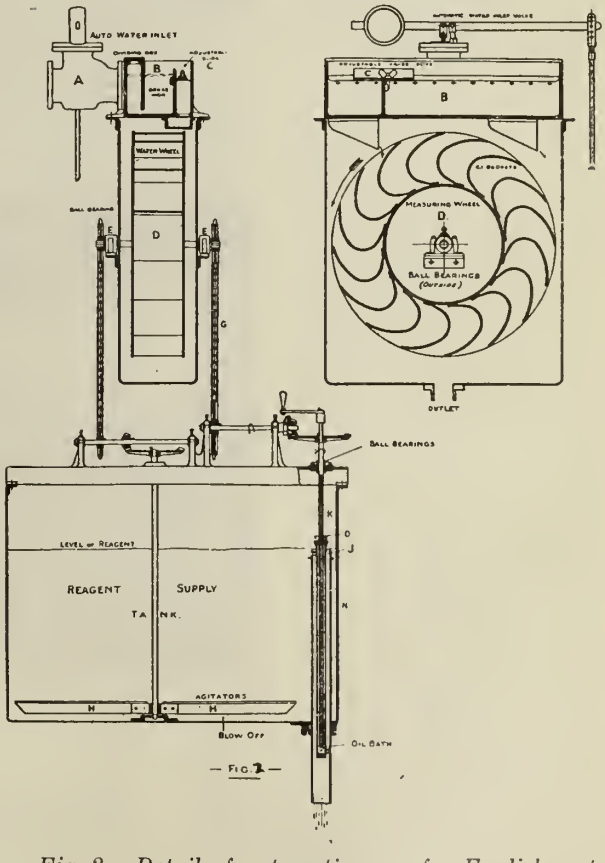


Fig. 2.—Detail of automatic gear for English water softener.

are not allowed to remain in the supply tank indefinitely. This is emptied and swilled out at frequent periods. Particular care is taken that any accumulation around the rising and falling pipe is removed. The gland in the bottom of

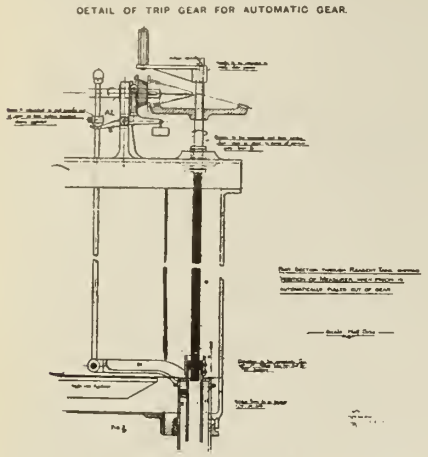


Fig. 3.—Detail of trip gear for English water softener.

the tank through which this pipe works also receives attention.

In working the plant a constant feed is maintained so far as is possible. The re-agents are carefully added and this is done whenever necessary. Frequently water softeners are very badly neglected and allowed to run sometimes for hours, and even days together without any re-agents being added to them. Another very common fault is to tip re-agents in in indiscriminate quantities. They should be accurately weighed and great care should be exercised in doing this.

In testing the hardness of the water the apparatus required is a 70 c.c. pipette or measure, 2 burettes to hold about 25 c.c.'s, an 8 oz. stoppered bottle, a white dish to hold not less than 150 c.c., and a small glass stirring rod. The re-agents required are Clarke's soap solution, decinormal sulphuric acid, and small bottles of silver nitrate and methyl orange. The water to be examined should be quite clear. If it is not it should be passed through an ordinary filter made from blotting paper in a glass funnel. Assuming the test to be of the softened water from the plant, three tests are required. To a few drops of the water on a white tile one drop of silver nitrate solution is added. There will always be a precipitate formed, but if it is white it will intimate that there is sufficient lime being used. If it is the palest tinge of yellow it will intimate that the quantity of lime being used is correct; if it is deep yellow or brown, too much lime is being used. In testing it is pointed out that to a fresh sample of 70 c.c. of water in an 8 oz. bottle it is necessary to add solution to a little at a time and shake vigorously after each addition until a permanent lather is formed. If 6 c.c.'s of soap solution will produce the lather, the water will be softened to 5 degrees. Clarke (i.e., it is always 1 degree softer than indicated by the soap itself). If a smaller quantity of soap is required the water is softened below this degree. If a larger quantity of soap is required the water is imperfectly softened and more re-agent will be required. The lather should hold for a considerable time when the bottle is at rest. If it disappears in two or three minutes, it is not permanent and more soap solution should be used. Another 70 c.c. of water should be filtered through a paper filter and run into a white dish. One drop of methyl orange should be added and decinormal sulphuric acid added a drop or two at a time until the sample just commences to turn pink. The number of c.c.'s of acid used should be noted. This should be multiplied by 5 and the result is the total alkalinity of the water in grains per gallon. This should not be much in excess of the hardness indicated by the soap test. If it is, re-agent, usually soda, is being added in excess and consequently wasted.

In the accompanying illustrations, Figs. 4, 5 and 6, may be seen several

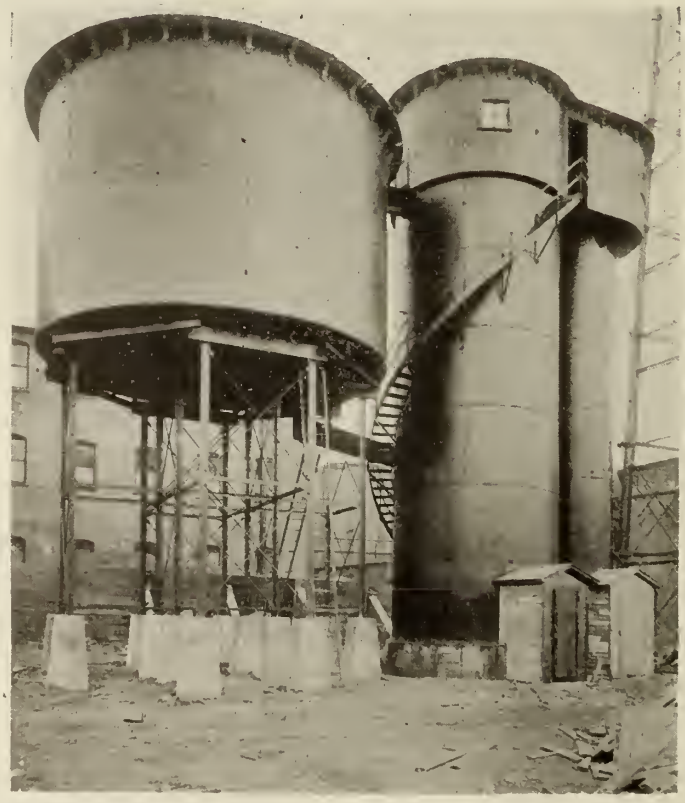


Fig. 4.—12,000 gallons per hour "Eureka" water softener working automatically in connection with a 50,000-gallon storage tank.

American water softeners of the Eureka type, developed at Mishawaka, Ind. The photograph, Fig. 4, shows a large water softener of a capacity of 12,000 gallons per hour, working automatically in conjunction with a 50,000 gallon steel

Fig. 6.—6,000 gallon per hour Eureka water softener treating water for the Lockport Paper Co.

storage tank of the Felters Co., of Lestershire, N.Y.

Two smaller American water softeners, of 3,000 gallons and 6,000 gallons per hour, may be noted in photographs, Figs. 5 and 6, the former being used for treating canal water for the Lockport Paper Co., at Lockport, N.Y., and the latter at the Lehigh Valley Silk Mills, at South Bethlehem, Pa.

The American automatic water softener and purifier is arranged so that the water may be supplied to the inlet valve in the tank either by pressure or gravity. A constant head is maintained in this tank, and the weight of the water falling on the wheel furnishes all the power required to actuate the plant. A portion of the raw water is diverted from the tank to a saturator where a clear lime solution of constant strength is manufactured. In this method none of the impurities in the lime come in contact with the water to be treated, thus there are no lime particles to go over into the piping and boilers. The alkalinity of the purified supply is practically nil so that there is not only no danger of foaming in the boilers, but the water is eminently suitable for all kinds of high-class work such as in laundries, wool-scouring, dyeing, etc.

There are provided a series of spiral plates to accelerate the precipitation of the impurities as the water travels up

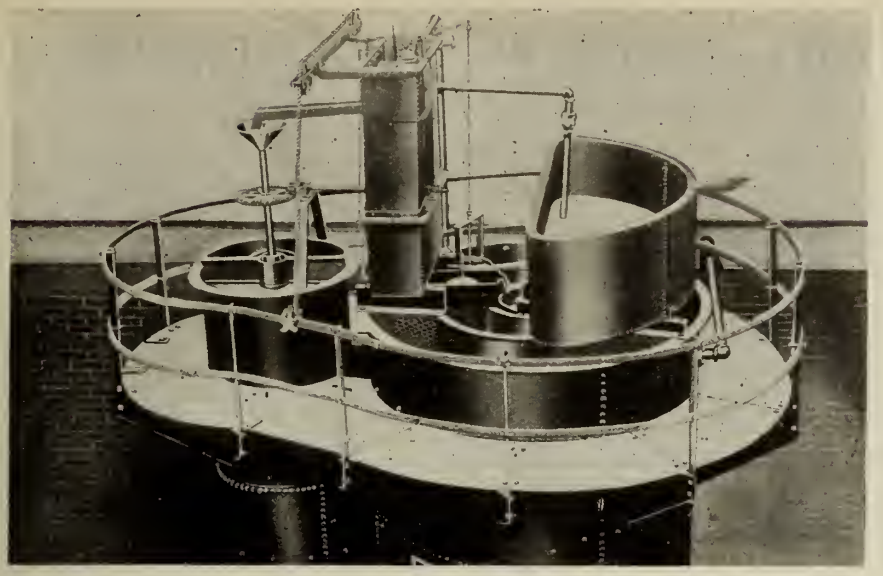


Fig. 5.—Details of mechanism of 3,000-gallon water softener.

wards after the chemical reaction has occurred. The sludge deposited on these plates gravitates into the cone, from whence it is flushed to the sewer by simply opening valve for a few seconds daily. After leaving the spiral accelerators the water passes through a wood fibre filter into a reservoir, from which point it is drawn off for use, all scale-forming matter and mud having been removed. The machine starts and stops automatically as water is required and will supply any quantity up to the rated capacity. The only attention necessary is about 20 minutes daily, which can be given by the engineer or other responsible employee without interference with his regular duties. It is never necessary for any purpose whatsoever to enter the machine.

In considering the water question, it will be stated that in converting water into steam there is, under the most favorable conditions, a great waste of heat energy. To minimize this loss has been the aim of mechanical men and inventors ever since the adoption of steam as a motive power. Heaters, stokers, economizers, pipe coverings, all tend to conserve the energy produced by combustion and to convert it into a potent factor. Manufacturers recognize these accessories as modern developments in steam engineering and consider them good investments.

Even at this age of advanced economies, when every department is closely scrutinized by experts to discover leaks and methods devised to lessen the cost of manufacture, it is marvellous that until the present day the very essence of economical steam generators, a non-scaleforming feed water should have escaped scientific treatment. Practically all natural waters are impregnated, to a greater or lesser extent, with soluble metallic salts, which tenaciously attach themselves to the boiler tubes and shell as the water is evaporated into steam, thus forming a cement coating that not only persistently resists removal but is also a non-conductor of heat. The extent of this non-conductivity is better appreciated when it is understood that most feed water contain (in addition to other solid matter) considerable quantities of magnesia, which is extensively employed in pipe coverings to prevent the transmission of heat.

In many cases, after poison in the form of impure waters has been injected into the boiler, antidotes (boiler compounds) are administered in a vain endeavor to offset or neutralize the action of the poison. The compound cannot keep the impurities out of the boiler, and its most perfect theoretical action would only convert the solids into sludge, but it does not even do that, as engineers will testify. Aside from many of these, medicines have a baneful effect, causing leaky tubes, foaming.

Mechanical cleaners are expensive to operate, both as to power and labor required, and the more inaccessible parts of the boiler are never reached. In many plants a force of men are continually at work drilling out tubes. Exhaust steam feed heaters can remove from water only the carbonates (lime) as these are held in solution by carbonic acid gas, which is expelled by ordinary boiling at atmospheric pressure, and the carbonates, being thus released, are partially precipitated in the heater. The sulphates, however, which form the hardest kind of scale, are not affected in the heater, and pass on into the boiler, where they are precipitated by the high temperatures attained under pressure.

It is maintained that the utilization of waste steam for heating feed water is of vast economic value, but the supplying of non scale-bearing water to the boiler is of much greater importance. The manufacturer is eternally studying how to reduce operating expenses, and scrutinizes with microscopic care every department in his factory. He is now tackling the power centre and must recognize that economy and efficiency in the boiler room must be be of the most approved design.

McFALL ALLEGATIONS

(Continued from page 15)

fare on the trusts in the United States contrasts with the lethargy of the Canadian authorities. The abuses in Canada are relatively as great, but our Governments are afraid of Big Business.

Dr. McFall says that infractions of the law have been disclosed in the matter of articles of clothing and some of the most important foodstuffs. If the laws have been broken, why are the lawbreakers not brought to trial? People have a vivid recollection of the orgy of profiteering in the early stages of the war. They recall the disclosures of "that man O'Connor," who preceded Dr. McFall as an official sleuth, but was withdrawn because he was too hot on the trail of powerful interests. The evidence before the Cost of Living Committee of Parliament is also fresh in their minds. But they have yet to see a profiteer punished, or a combine dissolved."

Says McFall is Right

Under the heading "McFall is Right," the Hamilton Spectator says:

"Local retail plumbers state that they are perfectly aware of the fact that there is an elaborate combination which is responsible for the ever-increasing cost of plumbing and sanitary supplies, as asserted by Dr. McFall, the Cost of Living Commissioner, in a statement made public yesterday. Dr. McFall denounced the activities of this combine at a time when the excessive prices of building materials were working a hardship, as pernicious.

"'Of course, it's not the retailers he is getting at,' said Norman Clark; 'but it is common knowledge that the manufacturing and jobbing end is governed by a combine—just the same kind of combine as exists in all lines of manufacture. It is common knowledge that all manufacturers are protected in this way. As for the jobbers, they are out to make a living, the same as the rest of us.'"

A Toronto View

The Mail and Empire, Toronto, says editorially: "If what the Cost of Living Commissioner says about a plumbing combine is true, the new Court of Commerce has work piling up for it. The evidence that the Commissioner has collected in this and other cases should be made available to the court as soon as it is ready for business. If high prices are evidence, there has been a plumbing combine for many years."

BUSINESS FOR FUN OR PROFIT

(Continued from page 16)

homes and better health, and that is one national standpoint we can work for. The plumbers should take a leading part in matters of this kind. People expect them to know all about it. Take the mere question of bathrooms, for an example. Far too many people in planning their homes, stick the bathroom away in some dark corner or any old place where they think it will be out of the way. Many of the bathrooms in houses to-day are a positive disgrace. The bathroom should be one of the very best rooms in the house, bright and clean and attractive. It is a simple matter to make it so and not expensive. Somebody must take the lead in improving matters and who should do it but the plumbers? It is their game and if they would go after it it means a lot of good business for them. There are any number of installations that are now out of date and that should be replaced. All these things are matters for the plumbers to work together on and there are many others that would naturally suggest themselves.

(Continued on page 27)

Burning Steam Sizes of Anthracite

WITH OR WITHOUT ADMIXTURE OF SOFT COAL

Based on an article by William P. Frey, Fuel Engineer.

One of the most effective means of promoting fuel economy consists, frequently, in the substitution of a cheaper for a more expensive fuel. This bulletin describes briefly what modifications of furnace design and operation may be made in order to insure efficiency in burning mixtures of anthracite and soft coal in furnaces designed for one or the other of these two varieties of coal.

This is the third in the series of Engineering Bulletins issued by the United States Fuel Administration in collaboration with the Bureau of Mines, Department of the Interior. This series is receiving very favorable comment. In the next series the first instalment on "Saving Fuel in Heating a House," will appear. This article covers this phase of the question thoroughly and should appeal to every heating engineer.—EDITOR'S NOTE.

THIS bulletin describes, in the simplest terms, how to burn steam-size anthracite, or mixtures of this, with soft coal so as to get the most steam from the least fuel.

While the essential difference between the burning of anthracite and the burning of soft coal consists, in the case of anthracite in the use of a somewhat smaller volume of air per pound of fuel and a stronger draft, slight alterations in the method of firing and in the furnace, designed for one or the other fuel, are also necessary in case mixtures of soft and anthracite coal are used.

Just what volume of air and what strength of draft must be used to burn any particular fuel in any given furnace can only be determined by actual trial and, being once determined, must be maintained as long as the particular fuel is used.

Sizes of Anthracite Used For Steam Generation

There are four of these sizes, commonly known as "buckwheat" and generally classified as follows:

TABLE 1

Size of Coal.	Size of round mesh over which screened Inch	Average heat values per pound of coal B.T.U.
No. 1 Buckwheat	5/16	12,250
No. 2 Buckwheat (rice)	3/16	12,000
No. 3 Buckwheat (barley)	3/32	11,500
No. 4 Buckwheat	3/64	11,000
No. 5 Buckwheat	3/64	10,000

The curves (Fig. 1) give the approximate British thermal units per pound of anthracite of known ash content.

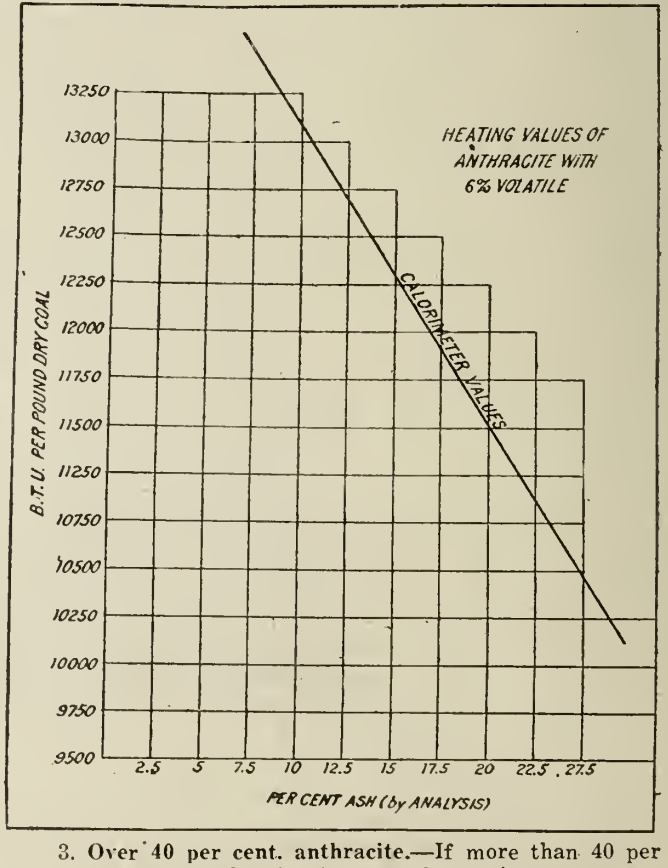
A mixture of these sizes known to the trade as "boiler fuel" is sometimes used. No. 3 of good quality can be and is burned with excellent efficiency under proper hand-fired conditions. No. 4 is not so suitable for hand-fired furnaces.

Furnace Equipment Required For Burning Various Percentages of Steam Anthracite and Soft Coal

1. **Twenty per cent. anthracite.**—With ordinary furnace equipment designed for soft coal, up to 20 per cent. "buckwheat" or fine sizes of anthracite may ordinarily be burned without any change of equipment or firing practice. Owing to the fact that most boiler furnaces are operated below their normal capacity on soft coal, the above percentage of anthracite can be added without decreasing the capacity of horsepower output of the boiler plant.

2. **Twenty to forty per cent. anthracite.**—If a greater percentage of anthracite screenings, 20 to 40 per cent., say, is mixed with the soft coal, it will be necessary, in order to obtain full boiler horsepower, to produce air pressure under the grate. One of the simplest and best methods of obtaining the necessary pressure of one-half to 2 inches in the ash pit, is to install a blower of the turbine type for each boiler. Such a blower may be installed very easily and quickly since it may be fitted into the side wall of the ash pit. It should not use over 3 per cent. of the steam developed by the boiler when operating at full capacity. The cost of a steam turbine blower is approximately $200 for a boiler of 150 horsepower or more.

A steam jet blower may be used instead of the steam turbine blower above mentioned. This is cheaper, and the more economical types of steam jet blowers are quite satisfactory in producing the desired results. In purchasing a steam jet blower it is most important to investigate its steam consumption. The best type of these blowers will operate on about the same steam as that required by the turbine blower, whereas the poorer ones may take from two to five times that amount of steam, in which case they should not be installed. The cost of the steam jet blower should be from $50 to $75 or more for a single boiler of 150 horsepower and up. The turbine blower, or the steam jet blower, should be controlled by means of an automatic draft regulator of the "partial throw" type, in order to obtain efficient results, although fair results are obtainable by hand regulation.



3. **Over 40 per cent. anthracite.**—If more than 40 per cent. of small anthracite is used the equipment recommended is forced draft plus "buckwheat" grates and a good automatic draft regulator.

The grates should vary in the matter of diameter of air openings, draft area, and total surface in accordance with the specific fuels used and their proportions in the mixture.

Some plants are able to run efficiently on 100 per cent. of a good quality of fine anthracite if properly equipped for this purpose. The table given below furnishes additional data as to mixtures of various sizes anthracite and soft coal that may be burned under different conditions of draft.

TABLE 2.
Proportion of Soft and Hard Coal to be Used.
(For hand firing.)

		Soft. Per cent.	Hard. Per cent.
No. 1 Buck	(Forced draft	30	70
	(Natural draft	40	60
No. 2 Buck	(Forced draft	40	60
	(Natural draft	50	50
No. 3 Buck	(Forced draft	50	50
	(Natural draft	65	35
No. 4 Buck	(Forced draft	65	35
	(Natural draft	80	20

Mixing Soft With Anthracite Coal

Proper mixing is most essential. It can be done either by delivering in a wheelbarrow alternate and predetermined portions of the two kinds of coal, and then mixing by not less than two "turnovers" with a shovel before dumping in front of the furnace, or, on a larger scale, by a similar delivery of carload lots to the coal tipple.

Grates

Grates for the fine sizes of anthracite have small air openings which vary in form from round holes, as in the pin-hole grates, to elliptical holes and straight slots, the width of slot or the diameter of the hole varying from ⅛ of an inch up to 5-16 inch. The percentage of draft area through the grate would vary from 3 to 30 per cent.

Stationary, shaking, or dumping types of grates for burning the fine sizes of anthracite may be obtained. The dumping and shaking types facilitate the cleaning of fire with less drop in steam pressure, which is an important feature. A large ash pit is advisable so that fires may be cleaned by dumping or shaking grates, without the necessity of opening the ash-pit doors more than once in 24 hours. The ash-pit doors with forced draft are, of course, sealed to make them air-tight, and, therefore, the less often they have to be opened the better. Or still better, separate the undergrate air chamber from the ash pit and install a dead plate in front of grates to dump ashes.

Owing to the slower rate of combustion, the grate area for small sized anthracite is made larger than for bituminous coal in order to develop the same horsepower, except in cases where the soft coal boiler already has an unnecessarily large grate, which is ordinarily the case. The relation of the grate area to the heating surface is also of importance. This relation is shown in Table 3.

TABLE 3.
The Relation of Grate Area to Heating Surface.

For No. 1 buckwheat, 1 to 40.	For No. 3 buckwheat, 1 to 30.
For No. 2 buckwheat, 1 to 35.	For No. 4 buckwheat, 1 to 25.

The fuel bed should not be less than 6 feet from any point of the boiler-heating surface.

There should be from 2.5 to 3 cubic feet of combustion space to 1 square foot of grate area.

Another detail of furnace construction which is important is that of the division of the heating surface into the so-called passes.

As the furnace gases in passing from the fuel bed to the stack are continuously cooling, their volume is consequently decreasing continuously so that the area of the passes should be diminished in the same proportion to cause a uniform flow. The relation between the area of the various passes should be so as to include total boiler-heating surface about as follows: First pass, about 43 per cent. of total heating surface; second pass, about 32 per cent. of total heating surface: third pass, about 25 per cent. of total heating surface.

As the width of the gas passage is uniform, the necessary reduction in the volume of the passes is made by reducing the thickness of the gas stream about as follows: In first pass, from 100 to 68; in second pass, from 68 to 52; in third pass, from 52 to 50.

Firing

Anthracite coal must be fired evenly in small quantities, and at frequent intervals, the intervals of cleaning depending upon the nature of the coal, rate of combustion, and the skill in spreading thinly and evenly.

The leveling bar must be used sparingly, and only for the purpose of keeping the fuel bed level and to keep the thin spots covered up.

As a rule it is bad practice to let a fuel bed of No. 1 "buckwheat" grow thicker than 8 inches and No. 2 "buckwheat" should not go over 10 inches, preferably not over 6 or 8 inches, respectively.

Where an automatic damper regulator is installed, it is important that coal be supplied to the fire in proportion to the air supply; that is to say, as the blower speeds up the firing should also be speeded up and as the blower slows down the rate of firing should be decreased.

Efficiency—The Means of Promoting It

With a good grade of steam anthracite, it is possible to obtain almost as high an efficiency as with bituminous, provided the equipment and operation of the plant are suitable, and very frequently, moreover, large savings in cost of fuel to generate steam are effected by substituting steam sizes of anthracite for the more expensive bituminous coal. The best results cannot be obtained unless the changes indicated are made so that the furnace becomes efficient for the anthracite. It is extremely important in burning the steam sizes of anthracite to provide against a large excess of air to the fire. The ideal way to burn this fuel is to use undergrate draft and to throttle the uptake damper to a point where the volume of air will be reduced to a minimum for proper combustion. The necessary pressure for penetrating the bed of fuel is supplied by means of the blower, and the volume is regulated by means of the uptake damper. With this equipment an automatic regulator should be connected for the purpose of controlling the draft in accordance with steam requirements, all of which is ordinary standard equipment which may be obtained for the purpose.

It must be emphasized that the greatest loss in burning the fine anthracite is on account of too much air for the fire, and the principal way to keep this air down to a proper minimum is by using the uptake damper, throttled as much as possible so as to produce the highest Co_2 without the formation of unburned gases. Loss from this source is much less probable than in the case of soft coal, with its high volatile content, so that with good installations, the CO_2 may be run at 15 or 16 per cent. under correct supervision and regulation. This percentage of carbon dioxide indicates that practically no more saving can be made by closing the damper still further.

The boiler setting, of course, should be made tight and kept tight. The draft or "suction" over the fire should be kept as low as possible; under ordinary conditions this should run between 0.10 and 0.25 of an inch, water gauge.

Summary

A boiler plant, designed for soft coal and operating on natural draft is capable of using 20 per cent. of steam sizes of anthracite mixed with soft coal without material loss in efficiency, and without change of equipment, provided, sufficient grate surface is available, and this is usually the case. Still higher percentages of fine anthracite may be mixed with the bituminous, provided, certain changes are made in the furnace equipment.

Between 20 and 40 per cent. of small size anthracite may be burned with bituminous, by installing a blower in order to create the necessary draft pressure in the ash pit to penetrate the bed of fuel.

Continued on page 25

EDITORIAL COMMENT

GET AT THE FACTS

AS a result of Dr. McFall's statements, many items have appeared in the daily press, in both the editorial and news columns, which not only reflect on the trade but are harmful. What affects one branch of the business has a direct effect on all, especially in the minds of the general public. To the average man in the street, manufacturer, plumber and jobber, all mean the same thing. In his statement, Dr. McFall singles out the jobbers. The great mass of the public who read Dr. McFall's remarks do not know what a jobber is. To such people, and there are thousands of them, Dr. McFall's remarks simply mean that the plumbers are a lot of pirates and profiteers. Dr. McFall did not say this at all, but accuses the plumbers of being the victims of the jobbers. The wrong impression that gets abroad regarding the man in the trade is unfortunately heightened by the fact that the plumber has been made a joke of for a long time by certain funny papers and other papers. This is unfortunate because the plumber does not deserve it and also because he has, in the great majority of cases, taken all such unnecessary remarks without defending himself. If a man called a plumber a robber, the plumber usually let it go at that without coming back at the party. In connection with the statements of Dr. McFall, it is important that all the facts should be obtained and made public. As will be seen on another page in this issue, Frank R. Maxwell, president of the Dominion Association of Domestic Sanitary and Heating Engineers, speaking on behalf of the men in the trade, declares frankly that the installers are not getting the money and invites an inspection of his books at any time. Others in the trade take the same stand and it is perhaps significant that all are willing not only to throw their books open to anyone interested but offer to assist the Dominion authorities in clearing up profiteering, if any exists. This attitude of the men in the trade indicates a new spirit and one which should be encouraged. It may be that in the future when a plumber is charged with being a robber that he will come right back and either make the accuser prove something or keep quiet. The plumber has a distinct and very useful work to perform. His work is largely responsible for not only the comfort but the good health of the home. Considered either individually or nationally, these are of real importance. Without the plumber the larger centres of population would quickly be ravaged by all kinds of diseases and the average home would return to conditions that existed a hundred years ago. If the men in the trade are, as Dr. McFall alleges, being made the victims of the jobbers, the whole country should know it. This is only fair to the trade. If, on the other hand, there is nothing in the charges of Dr. McFall, a gross injustice has been done the jobbers and they should be set right in the eyes of the public. All the facts should be ascertained and made public.

HOUSING DIFFICULTIES

NOW that many of the Ontario municipalities have called for tenders under the Housing Commission's plans some interesting developments are taking place. In a great number of cases it is found that the tenders are high. Many of them are so high that the local housing committees are endeavoring to get local contractors and in some cases outside contractors to figure. Others are trying to revise their plans. This whole situation is interesting in that it reflects the advances that have taken place in prices. When many of these housing plans were formulated, not long after the armistice was signed, there was a general impression in the minds of the public that prices were going to come down. Many of the figures in connection with the plans were based on prices prevailing early in the year. Six months has seen a lot of changes in prices but as far as building materials is concerned they have been upward and not downward. This is one reason why the housing committees are getting figures that are so far in excess of their estimates. Not only have commodities such as lumber, brick, hardware, glass, etc., advanced, but wages are higher and working days shorter. There are new conditions also which were not considered when the plans and estimates for the dwellings were secured. It is questionable if the efforts of the committees to lessen the cost of the dwellings is advisable and hardwaremen might do well to use all their influence against any move of this kind. As the houses stand they were designed to meet reasonable demands at the lowest possible cost. Any further paring is likely to result not only in really "cheap" houses being erected, but in the building of dwellings which in five years or even

less will look just as cheap as they are and will be unsatisfactory to their owners and unsaleable. According to one report in a daily paper regarding some dwellings which were gone ahead with, "The cheap design and the cheap materials used seem to be the one great cause of comment. One returned veteran points out that the sides are being stained only where the specifications call for two coats of linseed oil." This is merely a comment before the buildings are finished. What will be said after the houses have faced the wear and tear of five summers and winters? The trade can do a lot to check troubles of this kind by standing out now for the erection of good homes and no skimping of materials to slightly lessen the cost.

CONCERNING INSURANCE

HAVE you enough insurance on your store? This does not mean that SANITARY ENGINEER is trying to sell insurance, but the question is prompted by what those in touch with many retail merchants tell us about the small policies held by many firms. Many serious losses are constantly occurring because merchants do not adequately protect themselves. You have a good store and a good stock and a business that has taken time to establish. You probably reckoned the replacement cost when you put on the insurance and acted accordingly. But have you ever stopped to think what your replacement cost would be now? The buying price of many lines of supplies has greatly increased. Has your insurance kept pace? You may say you are willing to take a chance and be covered on your initial investment. Well that is your own affair, but there is a real situation here that cannot be overlooked. A stock that has been in only a short time could not be replaced now for a good deal more than it cost. Many lines are still advancing. You can figure out everything for yourself and it may surprise you to find out how much the difference is. The point is, if a fire should wipe out your store to-night, would your insurance policies protect you? This is a point that should not be overlooked.

HENRY FORD IN COURT

IN a large number of the daily papers there have appeared editorial comments, some at considerable length, concerning what Henry Ford has said and admitted in the witness box in his suit against the Chicago *Tribune*. No doubt Ford has told enough to make it certain that he is not a keen student of political science nor historical matters.

These articles for the most part are concerned in taking a fall out of Henry Ford, largely because he admitted he did not know at times what he was talking about.

Are there never occasions when the same daily papers discuss subjects in a way well calculated to make the informed reader see they do not know what they are talking about?

Many Canadian editors discuss the problems of the British navy, and many of them have never sniffed salt water.

They pile into long-distance discussions at times of semi-technical matters in a way that shows how barren they are of even the fundamentals of their subject.

Why not take Henry Ford in his own back yard, namely, as a manufacturer and an organizing genius?

Why not take him as an employer who long ago put in a $5 per day wage, then a $6 and $7?

It is somewhat of a knot-hole vision to size up a successful man entirely on a matter and in a field where he is admittedly not a specialist.

THE OUTGOING ALIENS

FEW people, according to manufacturers, realize the effects that the steady stream of emigration from this country back to Europe is going to have on production. Ever since it became possible for these men to get boats home they have been leaving in hundreds. Because little was known about them or the work they did no attention was paid to them in ordinary times. Now, however, with business resuming normal conditions and factories endeavoring to speed production to supply markets that are bare the alien is getting conspicuous by his absence. A large manufacturer of sanitary appliances stated to SANITARY ENGINEER that he did not know what he was going to do to get unskilled labor. Scores of the men who have gone home to visit relatives from whom they have not heard for five years, did all kinds of hard, heavy jobs that Canadian workmen will not touch no matter what wages they are offered. It is quite true that they were unskilled, but even so, their work was very necessary. Not a few firms requiring manual labor are looking over their thinned ranks and wondering just how they are going to handle the orders that are coming in with every mail. From a sanitary engineer's standpoint the situation indicates that production may be greatly delayed and that orders are likely to remain unfulfilled because manufacturers will not have the unskilled help to get the work out as fast as usual. No trades will be hit harder, it is stated, than the metal trades, because of the large amount of heavy work involved. The exodus of aliens from the United States is hitting Canada in another way also. Because among the thousands who have left, there were more than 40,000 coal miners, the output of coal is many millions of tons short. This is a situation also that is causing manufacturers who have not been able to get any large supplies in food for thought. All these things affect all business, and especially the plumbing business.

Toronto Society Picnic at Island

Tenth Annual Outing Was Attended by More Than 300 and Was a Splendid Success in Every Way—Sports Keenly Contested—Two Fast Ball Games Feature of Program

ISLAND Park has seen some merry crowds, but seldom has more real fun been packed into an afternoon than was enjoyed at the tenth annual picnic of the Toronto Sanitary and Heating Engineers. It was the first outing held under the auspices of the Toronto organization since 1916, on account of the war. The Toronto boys turned out en masse and with them came their wives and families. In all there were over 300 on the picnic grounds at Island Park when Frank R. Maxwell, president of the Dominion Association, who was made official announcer as soon as he arrived, started the races.

Weather Was Ideal

The weather was ideal for the picnic and everyone had the best kind of a time. It was a real old-time, get-together sort of affair, where old friends, who had not seen each other for a year or more, renewed acquaintance and ran races against each other, and played ball and enjoyed life generally, and forgot for the time that there was any such thing in the world as business. Among those at the Island were several of the "boys" who heard the call of the Empire and have only been home a short time after serving "over there." Needless to say that these were given an especially warm welcome.

No Race Suicide

It was manifest very early in the proceedings that there is no race suicide among the sanitary and heating engineers. As healthy and as husky a lot of boys and girls were on hand for the opening of the races as can be found anywhere, and maybe they didn't have all the fun that a crowd of carefree youngsters out for a good time can have. They raced around, and played ball, and ate ice cream cones and peanuts and candy as only children can. However, it was not only the young folks who had a good time. There was not a dull moment for either young or old during the whole afternoon and the older folks enjoyed themselves in their own way quite as much as anybody.

The Sports Program

The sports were started by a race for girls six years old and under. There were any number of contestants, some shy, some eager, and some wondering just what it was all about, but they all ran and it was worth while going over to the Island to see how happy they were when each was presented with a doll. Then came a race for the boys six and under, and every lad on the grounds who was eligible contested. They ran just as fast as their small legs would carry them and enjoyed the fun immensely. They enjoyed also the presentation which followed, each little fellow receiving a pail and shovel with which he could play in the sand.

Some More Races.

Girls of eight and under raced next, and just how fast they went may be gathered from the picture on the following page. They went so fast that the camera man could not catch them distinctly. Each girl was presented with a rubber ball and bat as a prize. Then came a race for boys under eight, and each lad was given a baseball and bat.

The winners in the other races were as follows:

Girls' race, 10 and under—1, Evelyn Menzies; 2, Beatrice Williams; 3, Marjorie Baker.
Boys, 10 and under—1, Jack Foster; 2, Jack Regan; 3, Ernest Hymers.
Girls, 12 and under—1, Beatrice Williams.
Boys, 12 and under—1, Jack Regan; 2, Howard Bell; 3, Louis Smith.
Girls, 16 and under—1, Mamie Smith; 2, Minnie Smith; 3, Rose Goodman.
Boys, 16 and under—1, Christie Menzies; 2, Wilfred Menzies; 3, Clarence Imber.
Single ladies' race—1, Mamie Smith; 2, Ruth Davis; 3, Minnie Smith.

Some Classy Baseball

Not in some time have spectators at the Island seen two classier games of ball than were played. It was freely remarked in the crowd that cheered the contestants that any time Manager Gibson of the Leafs wants to bolster up his team to win the pennant he can find "real" material among the sanitary engineers. The practices they have been having all summer stood some of the players in good stead, and they ran bases, batted and fielded like old-timers. In the first game between the sanitary engineers and representatives of the wholesalers, the latter nine did not have a look in, the sanitary engineers romping away with the victory by 19 to 4. Booth, who was in the box for the sanitary engineers, scored five runs himself, and Byrne, who did the catching, crossed the plate three times.

The teams lined up as follows: Sanitary Engineers: Pitcher, Booth; catcher, E. Byrne; first, J. Little; second, Griffith; shortstop, E. Winpenny; third, Purdy; right, H. Cohen; centre, E. Ramsay; left, G. Lynch.

Wholesalers: Pitchers, Glendenning and Darling; catcher, Staneland; first, G. Darling; second, J. Young; shortstop, Reading; third, J. Doughty; right, Horgood; centre, Sutheriand; left. G. Qua.

The Second Game

The second game was a much more even contest and took place between a team composed of sanitary engineers and representatives of the manufacturers. At the end of five strenuous innings both teams had had enough, and as each had scored nine runs it was decided to call it a draw. The teams lined up as follows:

Sanitary Engineers: Pitcher, Louis Palter; catcher, Walter Benson; Baker, Carburry, Le Groh, Warburton, Hall, Ruddick, McMinn, Weinraub.

Manufacturers: E. Quinn, pitcher; E. Cook, catcher; Addy, Mitchell, Cole, Stinson, McDonell, Phillips. Frank Maxwell, who umpired, gave general satisfaction.

Following the ball games supper was served.

ON THE SIDE

Helped by Imagination

Officer—"You're the best fighter in the regiment. What's the secret?"

Private—"Whenever I went against the Germans I pretended that they were the customers that I used to have to take insolence from and to whom I wasn't allowed to say anything back, when I worked in the plumbing business."

Let's Hope So

Mrs. C.—I wonder where in the world the alarm clock has gone! I saw it on the mantel yesterday.

Mr. C.—It was there yesterday, but I heard it going off this morning.

Mrs. C.—Well, I hope it hasn't gone where you told it to go.

Slow Headway

Practical science makes slow headway because it has to overcome long-established habits, declares G. F. Frankland. Apropos the subject, he repeats a conversation which he overheard:

"Hey, Moike, and phwat do ye tink of these new sanitary drinkin' cups?"

"Not much, Pat. Soon and we'll have to spit on our hands wid an eye-dropper."

Effective

Fond Parent—Did you hear my daughter sing?

Returned Soldier—Yes.

Fond Parent—What did you think of her range?

Returned Soldier—I should say she ought to kill at three miles.

Mrs. Flatbush—I don't know what's the matter with my doughnuts. They always seem to be heavy.

Mr. Flatbush—Why not try making the holes in the middle larger, dear?—Yonkers "Statesman."

SNAPSHOTS TAKEN AT THE TORONTO SOCIETY'S PICNIC

1. *Ernie Quinn, representative of the Taylor-Forbes Company, Limited, scratching the base.* 2. *Finish of the race for girls 8 and under.* 3. *Boys under sixteen getting started.* 4. *The Belyea Bouncers, children of Roy Belyea.* 5. *Inspector D. Kirk enjoying an afternoon with "the boys."* 6. *The Press enjoying ice cream cones; Messrs. Parsons and Tindall of SANITARY ENGINEER, and Newsome of the "Sanitary & Heating Journal."* 7. *H. Ruddick, D.C.M., after being overseas nearly four years, proved himself a demon ball player.* 8. *George Baker, at bat, has just sent a long one to the outfield.* 9. *Girls, 8 and under, getting ready for a start in their race.*

BURNING STEAM SIZES OF ANTHRACITE

Continued from page 21

When over 40 per cent. of fine anthracite is burned, it becomes necessary or advisable to change to grates of smaller air openings, and also having smaller percentage of draft area and usually of larger total area.

With a given draft pressure or height of stack less horse-power will be developed from a boiler which substitutes 100 per cent. anthracite for bituminous, unless a blower is installed and the grates changed to suit the new conditions.

The steam sizes of anthracite burn more slowly than bituminous owing partly to the greater resistance to the passage of air through the finer fuel and partly to the very low content of volatile matter in the anthracite; consequently, in order to get the same horsepower out of the boiler, means must be provided to burn the anthracite at a sufficient rate so as to develop the same amount of heat as before with the bituminous. Owing to this slower rate of combustion of small anthracite coal, it is necessary to use a larger grate surface than with bituminous if the boilers are to be run at maximum rating, even when forced draft is applied.

The time has passed forever when efficiency in the use of fuel can be regarded as a matter of choice. You must either save more fuel which you can do easily, or you must continue to lose more money which you will do inevitably and needlessly. You can not pick or choose between these alternatives; you must take one or the other of these ways, for there is no middle course.

News from Here and There

CONTRIBUTIONS OF NEWS GLADLY ACCEPTED

NEW FIRMS

W. N. Adair, of Wingham, Ont., has opened a plumbing and steamfitting shop at Kincardine, Ont.

NEW COMPANIES

London Clay Products Company, Limited, head office London, Ont., capital $50,000, plans to manufacture and deal in sewer pipe, tile and building materials.

Wolverine, Limited, capital $60,000, head office Toronto, has been granted a Provincial charter and plans to acquire the business now carried on by the Canadian Wolverine Company, Limited, manufacturers and dealers in plumbing supplies. H. G. Waterman and E. T. Needham, of Toronto, are officers of the company.

OBITUARY

The death occurred at Barrie, Ont., of James Archer, superintendent of steamfitting for the Grand Trunk from Belleville to North Bay. He was a former resident of Port Hope, Ont., where he learned his trade with the late J. W. Quinlan.

Joseph I. Ferrier, aged fifty, a resident of Toronto for thirty years and for some time engaged in the plumbing and tinsmithing business, died at his home, 881 Manning avenue, following a long illness. Besides his wife he leaves two sons, Roy and Reaford.

Thomas S. Head, aged 70, for forty-five years in the plumbing business in Toronto, died at Ste. Anne de Bellevue from the effects of a cerebral hemorrhage. He had been ill for about two months with heart trouble and went to visit recently with his brother-in-law. The funeral was held from the family residence, 516 Dundas St., to St. James' Cemetery. Besides his wife, Mr. Head leaves three sons, William and Allan of Toronto, and Thomas L., overseas. A fourth son, Charles R., was killed in France.

TRADE NOTES

Work on a new sewage disposal station to cost $50,000 will be commenced at once at Dundas, Ont., the council having awarded a contract to F. F. Fry.

Chatham, Ontario, is going to have its waterworks system inspected by the chief engineer of the Provincial Hydro-Electric Waterworks section in the near future.

Peter Shiells, of Kincardine, hardware, stoves and plumbing, is giving up plumbing and steam fitting and will devote his entire time to hardware.

TENDERS

The Quaker Oats Co., Ltd., plans the erection at Saskatoon of a new plant to cost $250,000.

Dr. T. Manning, Sarnia, Ont., is preparing plans for the erection of eight dwellings at London, Ont.

Peabody's Sales Corporation, Ltd., Walkerville, Ont., contemplates building a $500,000 addition to its plant.

J. M. Morrison, Drinkle Block, Saskatoon, will call for tenders shortly for $12,000 residence.

R. Webber, P.O. Box 11, Windsor, Ont., will let contracts for plumbing and heating for two residences costing $4,000.

T. J. Medell, 100 Albertus Ave., Toronto, will let plumbing and heating work in connection with new residence.

Wesley Ham, Fergus, Ont., wants prices on all plumbing and heating goods for three new residences he plans to erect.

Tenders will likely be called shortly for erection of technical school and addition to high school at Sault Ste. Marie, Ont.

Louis Wiles, 466 Annette St., Toronto, has foundations in for three dwellings to cost $10,000, and will let plumbing and heating work.

George Lucas, 5 Playter Crescent, Toronto, will let plumbing and heating contracts in connection with two residences, cost $6,000.

R. Muir, 115 Chester Ave., Toronto, will let plumbing and heating contracts in connection with residences being erected at a cost of $15,000.

Tenders will be received until August 12, for the erection of a public building to cost $30,000 at Indian Head, Sask., for the Dept. of Public Works.

Tenders will be received until August 8, for the erection of a nurses' home to cost $15,000 in connection with the Charlotte Englehart Memorial Hospital at Petrolea, Ont.

P. L. W. Dupre, 15 St. Lawrence Boulevard, Montreal, is preparing plans and will call for tenders shortly for the erection of an apartment.

The General Motors Co., of Canada, Ltd., contemplates erecting fifteen residences at Oshawa, Ont., R. S. McLaughlin, Oshawa, president.

H. C. McDonald, Timmins, Ont., secretary of the Housing Commission, wants prices on all plumbing and heating goods for dwellings it is planned to erect.

John M. Lyle, 19 Avondale Road, Toronto, is preparing plans and tenders will be called shortly for a new bank to cost $50 000, at Preston, Ont., for the Bank of Toronto.

Tenders will be received until August 8, by the Dominion Canners, Aylmer, Ont., for all work in connection with a process room, engine and boiler house for a new cannery being erected at Strathroy, Ont., at a cost of $125,000.

Greene, Swift & Co., London, Ont., will call for tenders shortly for the erection of a reinforced concrete addition to their factory, also engine and boiler house to cost $30,000.

S. J. Wilson, secretary of the School Commissioners, Halifax, N.S., will receive tenders until August 30, for all work in connection with four new schools to be erected.

Coon & Son, Excelsior Life Bldg., Toronto, are preparing plans and will call for tenders for new technical school at Sarnia, Ont., to cost $250,000.

Tenders are open for all work in connection with the erection of a $50,000 creamery for the Saskatchewan Co-operative Creameries, Ltd., at Melfort, Saskatchewan.

WILL CONTAIN PUBLIC LAVATORY

A feature of a free air station that is being erected by the Imperial Oil Company at the corner of Bloor and Dundas streets, Toronto, at a cost of $20,000, will be lavatory accommodation for the public. The building will encroach eight feet on civic property and this was the cause of some discussion in the council when the question of granting a permit came up. It was finally decided that permission be granted on condition that the company agree to remove the encroachment on a month's notice, guarantee the city against damages and pay a rental for the property.

A CORRECTION

David K. Trotter, secretary of the Master Plumbers' Association of Montreal and vicinity, was inaccurately designated in the July 1 issue of SANITARY ENGINEER as secretary of Local Union No. 144, Montreal. This error inadvertently appeared on page 26 in connection with a report of a letter Mr. Trotter had written to the "Gazette."

A. S. OF S. E. ANNUAL MEETING

The annual convention of the American Society of Sanitary Engineering will be held at the Hotel Winton, Cleveland, Ohio, on September 15, 16 and 17. Among the matters to be taken up will be the establishment of a national code on sanitary installation. A number of papers on practical subjects will also be given.

NEW SEWAGE PLANT FOR BORDER CITIES

After several months' work the contractors have just finished construction of an entire new sewage syste mconnecting Ford, Walkerville and Windsor, and which will eliminate the dumping of the sewage into the river above the Windsor Water Works intake. The work cost $120,000 and was done by local men.

MAY BUILD NEW RESERVOIR

The authorities at St. Thomas, Ont., are preparing to solve the water shortage that exists there and have two plans under consideration. One is the construction of a new reservoir at a cost of $50,000, and the other is a storage dam, which would cost $85,000.

SAILS FOR ENGLAND

W. H. Cunningham, manager W. H. Cunningham & Co., 183 Church St., Toronto, has sailed for England on the Corsican and will visit England and Scotland for the purpose of conferring with firms who are represented in Canada by W. H. Cunningham & Company. During Mr. Cunningham's absence the business will be in charge of Mr. W. S. Hill.

RESCUES LITTLE CHILD FROM BURNING HOME

Crawling on his hands and knees into the burning home of Mrs. Burchell at Galt, Ont., B. Bennett, of the plumbing firm of Bennett & Scott, rescued her youngest child. Mrs. Burchell, whose husband is overseas, goes out to work during the day and left her three little ones at home. In some way the frame dwelling got on fire. The older children got out all right, but the youngest was in bed. Mr. Bennett, who was nearby when the fire was noticed, made his way through the house, which was filled with smoke and flames, and brought the little one to safety. Not only this, but he started a fund for Mrs. Burchell, who lost everything, as her home was completely destroyed.

BUSINESS FOR FUN OR PROFIT

(Continued from page 19)

"The trouble with too many of the plumbers," Mr. Coppins said in conclusion, "is that they can't get away from plumbing. They can't see a thing but plumbing, and they work away for years, and work hard, too, and make little or no money. What they need is a broader outlook and especially a broader outlook in regard to business. There is good money to be made by combining plumbing with merchandising, and one helps the other. By getting into merchandising they will become better business men, because they simply cannot help it and stay in business. If they are handling stock they have to know what goods they need, what they sold, etc., and keep some sort of records of turnover and expenses. A lot of the plumbers to-day have no idea at all about business methods, and they will never make the money they should make and can make until they get this business idea."

CATALOGUES and BOOKLETS

Catalogue No. 3, issued by the Josam Manufacturing Co., of Cleveland, Ohio, contains twenty-four pages, attractively illustrated, listing the various lines of drains manufactured by the firm. Copies of this catalogue will be forwarded to readers of SANITARY ENGINEER upon request.

NEW MUELLER CATALOGUE

H. Mueller Mfg. Company, Limited, Sarnia, Canada, have issued catalogue "A," featuring water, plumbing and gas brass goods. The catalogue is a handsome book of 275 pages, splendidly illustrated and printed on good quality paper. The company states that through the expansion of the Mueller lines, coupled with the company's policy in standardizing and eliminating duplication, it has been found necessary to establish an entirely new set of plate numbers for the firm's products. With the exception of tapping and drilling machines every article in the catalogue has a plate number preceded by the letter "A." The company emphasizes that goods should be ordered by the plate number prefixed by the letter "A," not by the name of the article. The figuring of cost has been greatly simplified by the adoption of per piece price list almost exclusively. At the back of the catalogue is a telegraph code, which makes it possible to wire an order at slight expense. The new catalogue precedes all previous Canadian catalogues, booklets, etc. The catalogue was compiled and edited by the advertising department of the company at Sarnia, Ont. Copies will be supplied to the trade upon request.

THE ALLPRISER

The Allpriser, which has just been issued by Kenneth B. Allison, 668 Yonge St., Toronto, is a flexible leather book, 7 by 9, containing approximately 150 pages, loose leaf. It is especially prepared for the plumbing and heating trades. According to Mr. Allison the book includes a list with net prices of all staple every-day articles at a glance. Included with the Allpriser is a regular service of price sheets, said to be compiled and revised every time a price change takes place. It is claimed that the use of this book will eliminate loss through guesswork, reduce overhead expenses, and assist in many ways to create greater efficiency in both buying and selling methods. All products listed in Allpriser are indexed alphabetically, and at the same time placed in a class number, which may be readily consulted in the numerical index. The front index consist of thirty pages, and this is followed by 25 classes. The book contains a vast amount of practical and valuable information, and with the continued price change service should prove valuable to the trade.

PICNICKED AT TASHMOO PARK

The annual picnic of the H. Mueller Mfg. Company, Ltd., of Sarnia, and the Mueller Metals Company, of Port Huron, was easily the most successful outing in the history of these two organizations. It was held at Tashmoo Park. The sports programme included no less than twenty-seven events. Special arrangements were made to entertain the former employees of the Mueller plants who worked on munitions during the war, Reception committees headed by O. B. Mueller, president of the company, and C. G. Helby, general superintendent, was at the dock to welcome these men.

Montreal Plans Closer Supervision of Plumber Licenses

Under New By-law All Applicants Must Pass a Specified Examination Showing Their Fitness to Practise — Good Results of Dominion Convention Already Apparent.

IT will be most welcome news to master plumbers in Montreal that the civic authorities are intending to require a more rigid examination of all those who would pose as plumbers. To this end it is proposed that By-Law No. 318 be replaced by By-Law No. 571. Under the arrangements contemplated it will be essential that applicants pass a specified examination showing their fitness to practise as plumbers. On this Board will be a representative of the Master Plumbers' and the Workers' Associations, and with them, conjointly, will sit the city sanitary engineer. An examination must be passed before license will be granted. Copies of the proposed by-law have been distributed to the various organizations for their comments and suggestions. Among those receiving this are the Builders' Exchange (with which is affiliated the Master Plumbers' Association), Architects' Association, Canadian Institute of Civil Engineers, Journeymen Plumbers' Association, and the Canadian Firewriters' Association.

This is an excellent move and one in which all master plumbers will take a decided interest. The plan follows closely the ideals borne out in the recent convention held at Montreal in June.

Heating and Ventilating

STEAM

Ninth Article of Series Prepared for Readers of "Sanitary Engineer" by N. A. Kearns

Editor's Note.—This article is the ninth of a series prepared especially for the readers of SANITARY ENGINEER, covering heating and engineering practice reduced to its simplest terms. Readers will find this article on "Steam" a most interesting and illuminative one. The first article of the series appeared in the April 1 issue. Descriptions of installations made in different classes of buildings will be given, together with the method used in making the design for these installations. It is not our purpose to give complicated formulas, but rather to present the simple rules that have been based on these formulas, in such a way that the reader will be enabled to design a heating and ventilating system without having to refer to the data given in engineers' hand-books. The author of these articles, Mr. N. A. Kearns, has designed heating and ventilating equipment for all classes of buildings in practically every province of the Dominion. Some of the buildings were such that the heating and ventilating equipment had to be installed under the most adverse conditions, whereas in other buildings the design for the heating and ventilating equipment was incorporated in the constructional drawings. The tenth article of the series will appear in the next issue.

WHAT is steam?

In answering this question we must ask the reader to take an imaginary journey with us to the field of elementary physics, and when there experimenting look into certain of the properties of steam with the purpose of coming to an understanding of what the terms used in the making of steam tables really mean.

To the mentally energetic the marked distaste of the average mind to look below the surfaces of the arts, the sciences and the occupations of man, is a mystery that continues to grow until the realization comes that the handicap is due more to a lack of imagination than to any phase of a mental laziness. And the imagination we refer to is not that quality of the mind that carries its possessor away on wool-gathering expeditions, but rather the gift that enables its owner to follow the author of dry descriptive matter through passages that should visualize in the mind those things that are hidden from the eye.

Now we refer to the imagination because more especially in this article than in any of the preceding ones it will be necessary for the reader to exercise his imagination in coming to a definite understanding of the subject under this heading. The strain on the imagination must of a necessity be great, whereas here we lack the actual experimental materials and the personal contact.

When writing of matters of a technical nature there is on one hand the temptation to consider that the standard of average education is high enough to make any reference to matters of elementary science seem almost impertinent, and on the other, when in the effort to avoid the error, for it is an error, an attempt is made to take up such matters at the very fundamentals, the danger of falling into a discussion of non-essential phases of natural science must be apparent.

Therefore if this article seems to go too far into details for one man, and not far enough for another, understanding this, they will not blame the author too much for what appears as an incomplete explanation or an unnecessary elaboration of a simple detail.

For the first step in our experiments we are to assume that we are making the experiments at a level, uniform with a mark set half way between low and high sea tides; we do this because at this level there is a pressure of 14.7 lbs. of atmosphere per square inch, and this pressure of 14.7 lbs. is the standard worked from and to for convenience in defining tables and establishing certain laws. We are to have a vessel containing exactly one pound of distilled water and the water is to be at a temperature of 32 degrees above zero F. We place this vessel on top of a fire and as the heat from the fire is transferred through the bottom of the vessel to the water the following action takes place: First the air contained in the water is driven off (the vessel is to be open to the atmosphere) then the water in the bottom of the vessel being heated expands and, of course, being lighter for its bulk than the water above, rises to take the place of the colder and heavier water descending. This action of circulation keeps up until the water reaches a uniform temperature of 212 degrees F., from then on it starts to make steam and keeps steaming without any rise in temperature until every particle of water is evaporated from out of the vessel.

Now when we refer to the data given in the first article of this series, we note that it takes one b.t.u. to raise one pound of water one degree, and knowing that the water, before it started to boil, had risen in temperature from 32 degrees F. to 212 degrees, we can estimate that it took just about 180 b.t u.'s to affect the change in the temperature condition of the water before it started to boil.

We cou'd have found had we taken its temperature, that the water during the time that evaporation was taking place was not increasing any in temperature, but we would also have noticed from the appearance of the water that certain elements that entered into the make-up of the water were becoming separated from and dashing up through the water above, when overcoming the weight of air, they were rising in the form of a gas or vapor, thus, water changed by heat into a gaseous state is steam.

If, instead of leaving the top of the vessel open to the atmosphere we had placed a cover on the vessel with a weight on top, the water would not have given off steam at a temperature of 212 degrees. We would have found that the temperature of the steaming point was proportioned entirely to the size of the weight holding down the cover. If the weight was, say 60 lbs., the temperature of the water would have to be raised to about 307 degrees before any evidence of boiling would take place.

Or if we, instead of placing a weight on the lid. had arranged to exhaust the air from between the lid and the water in the vessel. the action of boiling would take place at a much lower temperature than 212 degrees F., how much lower

would depend on how much weight of air we had taken off the water. If we had managed to get the air removed from the vessel so that instead of 14.7 lbs. of atmosphere pressing down on top of the water there was what might be termed one pound of atmosphere above an absolute vacuum, the water would boil at a temperature of 102 degrees.

From these experimental conditions we have found that the temperature at which water boils is controlled entirely by the pressure that the water is subjected to.

There is also another thing that we might have noted in our experiments, and that is the quantity of heat or the number of b.t.u. required to boil away the whole pound of water contained in the vessel, and if our experiments included an investigation of how much water could be heated by the steam evaporated from a pound of water we would find that it took just the amount of heat to evaporate the pound of water from 212 degrees to steam as it would take to raise 966 lbs. of water one degree. Therefore there would be 966 b.t.u. used in changing the water at 212 degrees to steam at the same temperature.

The amount of heat that is required to evaporate one pound of water at 212 degrees entirely into steam is called latent heat.

The amount of heat that it takes to raise the temperature of the water from 32 degrees above zero to the boiling temperature is known as the heat of the liquid.

The latent heat added to the heat of the liquid gives us what is known as the total heat.

The total heat required to evaporate one pound of water from 32 degrees F. is 180 b.t.u. (heat of liquid) added to 963 b.t.u. (latent heat) =1146 b.t.u. (total heat.)

It might appear that because the pressure above that of atmospheric pressure raised the temperature of the steam and the water confined in the vessel, an increased pressure must mean a corresponding higher temperature of all of the properties of the steam, but this is not so, for while it is true that as the pressure increases the heat of the liquid increases in temperature, actually there is less heat required under the increased pressure to evaporate the water from the higher heat of the liquid than was the case when the experimntal vessel was open to the atmosphere. For instance: a pound of water condensed from steam at a temperature of 417 degrees F. and at about 285 lbs. pressure above atmosphere, only gives up 818 b.t.u., whereas a pound of water condensed from vapor at a temperature of 102 degrees and a pressure of one pound above vacuum gives up 1,042 b.t.u. However as it only takes 70 b.t.u.'s to raise the temperature of water from 32 degrees to 102 degrees the total heat is in this case 1,043 b.t.u. (latent heat) plus the 70 b.t.u. (heat of liquid)=1,113 b.t.u. (total heat.)

The heat of the liquid for steam at 417 degrees is 390 b.t.u. The total heat is the 390 b.t.u's added to the 818 b.t.u's (latent heat) = a total of 1,208 b.t.u., is while the reader will understand that steam condensed at high temperatures contains less heat than steam condensed at lower temperatures the total heat is greater.

The reader should understand from the explanations here given why heat transference is more rapid at low pressure than with high pressures.

There is also another term used in connection with steam tables, viz., saturated steam. This term expresses the condition of steam when it is at the same temperature as the water from which it is generated. The term saturated steam does not mean that the steam is wet, in fact that steam may be entirely free from water, but if it is at the same temperature and pressure condition as the water from which it came it must be considered as being saturated.

Steam could be separated from the water and then heated, just as other gases may be heated. Its temperature could then be raised higher than the boiling point of a corresponding pressure. We call steam in this condition super-heated steam, and it takes just about half of a b.t.u. to raise the temperature of one pound of super-heated steam one degree at a uniform pressure.

Steam keeps decreasing in volume as its temperature is raised. For instance, steam generated from water at 1 lb. above absolute vacuum fills a volume equal to more than 20,000 times that of the water. Steam generated from water at atmospheric pressure fills a volume equal to about 1,600 times that of water, while steam generated from water at a temperature of 4,170 and a pressure of 285 lbs. above atmospheric is equal only to a volume of about 96 times that of the water.

The thorough understanding of the properties of steam is of the greatest value to an engineer in making a decision regarding the adaptability of a pressure or vacuum heating plant to the conditions of installation that may confront him.

It is, therefore, of the greatest importance that he carefully read and re-read everything that he can lay his hands on regarding this subject, and in his reading refuse to remain content until he is in a position to thoroughly pick to pieces and analyze every system of steam heating clear back to its basic principles.

Ventilating the Modern School

Eighth Article of Series Written Especially For "Sanitary Engineer" by N. A. Kearns—First Article of Series Appeared in April 1 Issue

WHILE there has rarely been a problem confronting the ventilating engineer in the practice of his art that did not bear upon its face its own evident solution, there have been too often in the past hampering influences imposed upon these men either by way of insurmountable material conditions or by the authority of some incompetent person.

Such a state of affairs was not alone peculiar to the problem of school house ventilation, but one that seems to be persistently present whenever a ventilating engineer was called into consultation.

Up until the time of owners of manufacturing plants discovering that the money spent on an apparatus for the maintenance of a certain standard of air purity in the building paid great dividends, and until the owners of theatres realized the importance of removing foul odors from their buildings, the profession of the ventilating engineer was looked upon more or less as one that provided a cure for an evil that did not exist. But since that time the owners of buildings requiring high grade ventilating plants have increased in number, and as each year more money is invested in ventilating apparatuses, there naturally follows a demand for an efficiency surpassing that obtained in the older ventilating plants. This has resulted in the ever increasing refinements of apparatus, so that now when a school board, or their engineer wishes to value a particular specialty they do not, as in the past, have to depend on theoretical knowledge done, but can, without much trouble, secure access to plants where such specialties are in use.

When inspecting some buildings where ventilating plants appear to be installed, the visitors may be disappointed in their expectation of seeing anything of value. They may be so unfortunate as to be in a building where the putrescent air is a sufficient explanation of the falling receipts of the box office. The visitors should understand that while some owners of places of public amusement have been very extravagant in the matter of paint and plaster, they have also been notoriously penurious where it is necessary to spend a few dollars that did not make much of an impression on the eye. It took the painful necessity of seeing the public pass by the box office to make these men realize that the condition of the air in the building was an offence to their potential patrons, so when a school board pays a visit to such a place they may find, as well as an antiquated ventilating system, an owner sitting and bemoaning the meanness that prevented the installation of a complete ventilating plant in his building.

The owner's fault was not always the root of the evil, for at times these owners were guided into their disastrous experiences by an architect who desired to save some money on the essentials so that he might spend it in a joyous ex-

uberance of meaningless balustrades, cartouches and other excrescences on the face of his aberration. Thanks be, the common sense of the dividend seeker has overcome the desire of such an expression of insincerity, and the public may now enter the principal places of amusement without the fear of being poisoned by the pestilential atmosphere of the place.

One almost may be sure that a poorly ventilated building is not a monument to the poverty of ideas on the part of the engineer so much as an indication of the poverty of the owner's purse or the selfishness of some individual that has been unfaithful to his trust.

When one aspires to a position of authority he must be able to look over a broader field of human knowledge and endeavor than that confined entirely to his own work. The possession of perfect tools is no implication that a man is a finished workman. Tables, formulas and so forth are only tools, and the possessor of these tools must be fitted to handle them by the mental growth corresponding to the manual skill developed. The equipment necessary to make an engineer consists more in the ability to take a broad view of his problem than it does in the mere mechanical skill necessary in making designs according to fixed rules.

The reader might believe that it would suffice to present the necessary tables and data in an article of this kind leaving the writing of the subject of education to a series of articles bearing only on that matter.

Education to many means a sort of thing that can be procured from books and schools, losing sight of the fact that education is only a guide to set a man on the road he must travel for himself. The guiding may prevent him from wandering into pitfalls, but sometimes if he holds fast to his guide, depending not in any way upon his own powers of observation he will seldom explore the bypaths that lead to a greater knowledge than that found along the beaten path.

Books may point the way but observation must be developed, as it is only through carefulness thus acquired that the ability is given to lay out work in a systematic way, neglecting no detail that spells success and incorporating nothing in the design without a cheerful willingness to dig for more than a superficial understanding of its value.

The object of writing of incomplete and necessarily imperfect ventilating systems is that we wish to emphasize that the ventilating engineer must not be satisfied to model his design wholly on what has been already done in his art. The man who wishes to stay at the top of his profession must continually step abreast of the times, and, while using as much of his predecessors' experience as he can obtain must not be satisfied to continue practising along lines that are obsolete. Another thing he must learn is that many of the ventilating systems now in existence are only cheap substitutes for what he will be called upon to install in the future.

There are scores of buildings that he may visit where he will see the most complete installations made for the conditioning of air and the conveying of that air to the rooms in the building. And in many cases he will find that while every detail of installation has been carefully considered up to the point of the escape of the foul air that the system of extracting the foul air is of the crudest type.

There is one school building the writer has in mind where the heating plant is a very good quality of its kind. The fan driving the air into the building is, if anything, too large for its purpose. The coils heating the fresh air are well proportioned and installed. The channels through which the fresh air travels are of the proper size and located in accord with the best principles of such work. But in this school the vent flues are carried to a loft under the roof where they deliver the foul air to escape through such accidental openings as may be found between the rafter feet and the cornice.

Do you think such a building is ventilated?

By no stretch of the imagination can the writer come to believe that the man who designed this system is satisfied with the results. Oh no, he was not responsible for the stopping off of the flues below the roof. This was a feature improving the chance of saving coal and was suggested to the school board by a wiseacre who fires a couple of furnaces in a church nearby.

Then over on the other side of the town there is a school where the conditions are about the same, but with the exception that the ventilating flues are carried right up to and through the roof. Is this a satisfactory way of extracting foul air? Well, it is a common way, but by no means a correct one. Here is what happens on a fairly windy day when the plenum fan is working away to the capacity of delivering 1,500 cubic feet of air per minute to each class room in the building: The rooms on the windward side receive only 1,200 feet of air through the fresh air faces and lose about 2,000 feet through the foul air vents; on the lee side of the building the rooms receive through the fresh air faces 1,900 cubic feet per minute, and the vents only pass 7,660 cubic feet of air in the same time. These figures vary with the velocity of the outer wind currents, proving that natural conditions can play havoc with the distribution of fresh air even in a mechanical ventilating system when every detail of the equipment is not noted and taken care of in the engineer's design.

In experimenting with a plant of this kind it was not found that the stopping up of the fresh air opening into the room had any appreciable effect on the diminishing of the quantity of the air escaping through the ventilating ducts. The only way that a normal condition could be established was to regulate and set dampers in the vent flues. It is hardly of any use placing hand regulated dampers in the vent flues, because of the remote chance of getting a janitor who is willing to go around adjusting these dampers as the direction and velocity of the wind changes. The best thing that you can do is to place light counterbalanced automatic dampers in the flues; setting these dampers in such a way that an air velocity increasing above a certain point may throw these dampers far enough over to partly close the openings.

The use of an exhaust fan will make it easy to regulate the dampers on the foul air outlets, but it must be borne in mind that the use of an exhaust fan alone, or in combination with a plenum fan, and without the use of automatic dampers, will not provide for the proper balancing of the air pressures in the building at all times regardless of the conditions of exposure.

In flues where the force of gravity is the power used in moving the air check dampers must not be installed down close to the base of the flue. Such dampers must be installed close to the top of the flue or flues, as otherwise the quantity of air escaping into the flue is hardly large enough to offset the counterbalancing weight of the cold air above and the result is a back draft.

In a later article we will give some suggestions regarding methods of cutting the cost of installations without leaving out certain of the most essential parts of the apparatus.

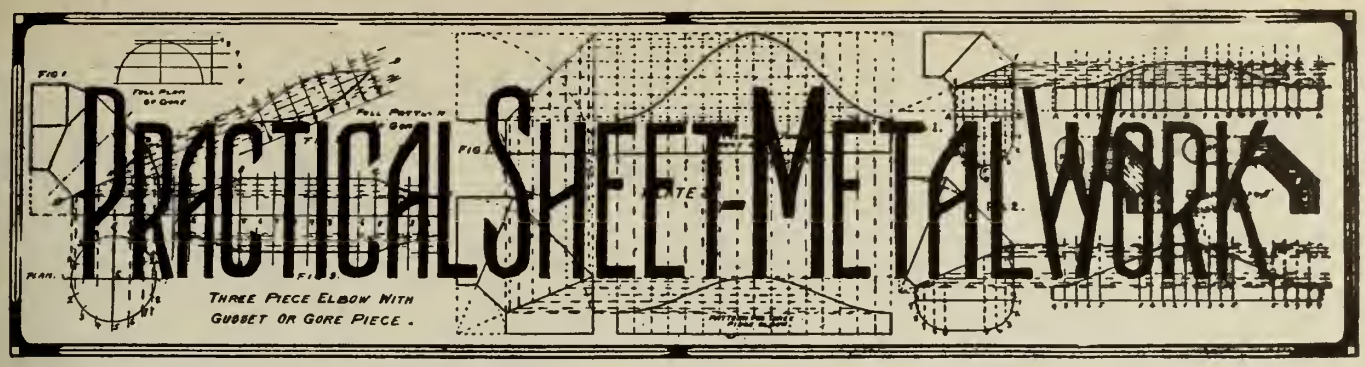
FRANK STOCKDALE LECTURE

Owing to lack of space, the concluding address by Frank Stockdale before the Retail Merchants' Association in convention at Regina has been withheld until the August 15 issue. This address will be on "Meeting To-day's Competition," and brings out many interesting points on the need of studying conditions and evolving new methods of doing business. Watch for it in the August 15 issue of SANITARY ENGINEER.

HANDLING COMPLAINTS

When complaints are made to you of goods or service, how do you handle them? Rudely or with the grace that will make out of the complaint a business builder? I believe a complaint handled properly can be made of great service to the store in so satisfying the customer that the treatment received will make for good will.

I saw a young man recently who was listening to an irate woman making a complaint. Instead of answering back and thus adding fuel to the flame, he listened until the lady had finished, and then tactfully called some one in authority, to whom he gave a synopsis of the complaint. In a few minutes the angry customer was smiling and a customer was saved. If the man had answered, or rather, argued with her, undoubtedly there would have been trouble. It pays to be tactful.



MUCH has been said about the enormous fuel waste that is taking place in Canada, but with the exception of one or two authorities very little has been said as to how fuel can be saved. Some have advised how a furnace should be operated, and have given reasons thus and so. But oftener than not most of this information is only of value providing that the furnace is properly installed and of a proper size, also it has been assumed that chimneys and smoke pipes have been O.K.

It would be safe, however, to say that at least 30 per cent. of the troubles with heating systems is due to poorly-constructed chimneys, and, in many cases, these can be remedied by adding a good type of chimney top.

A number of illustrations are here shown in connection with chimney caps and chimney construction. In our Canadian climate more care should be exercised when building chimneys. Many a furnace is installed that, do what one may, will never burn properly, and will not give off enough heat. When an extension to a chimney is made by adding a galvanized pipe as shown at A, plate 23, it should be installed in such a way as to protect the chimney top.

Fig. C shows how a chimney may be protected from cold and made much more effective if constructed in manner shown. It will be noted that where a chimney projects from the building line, at least one-half of the chimney is too much exposed, and particularly so when simply a single brick is built up on the outside.

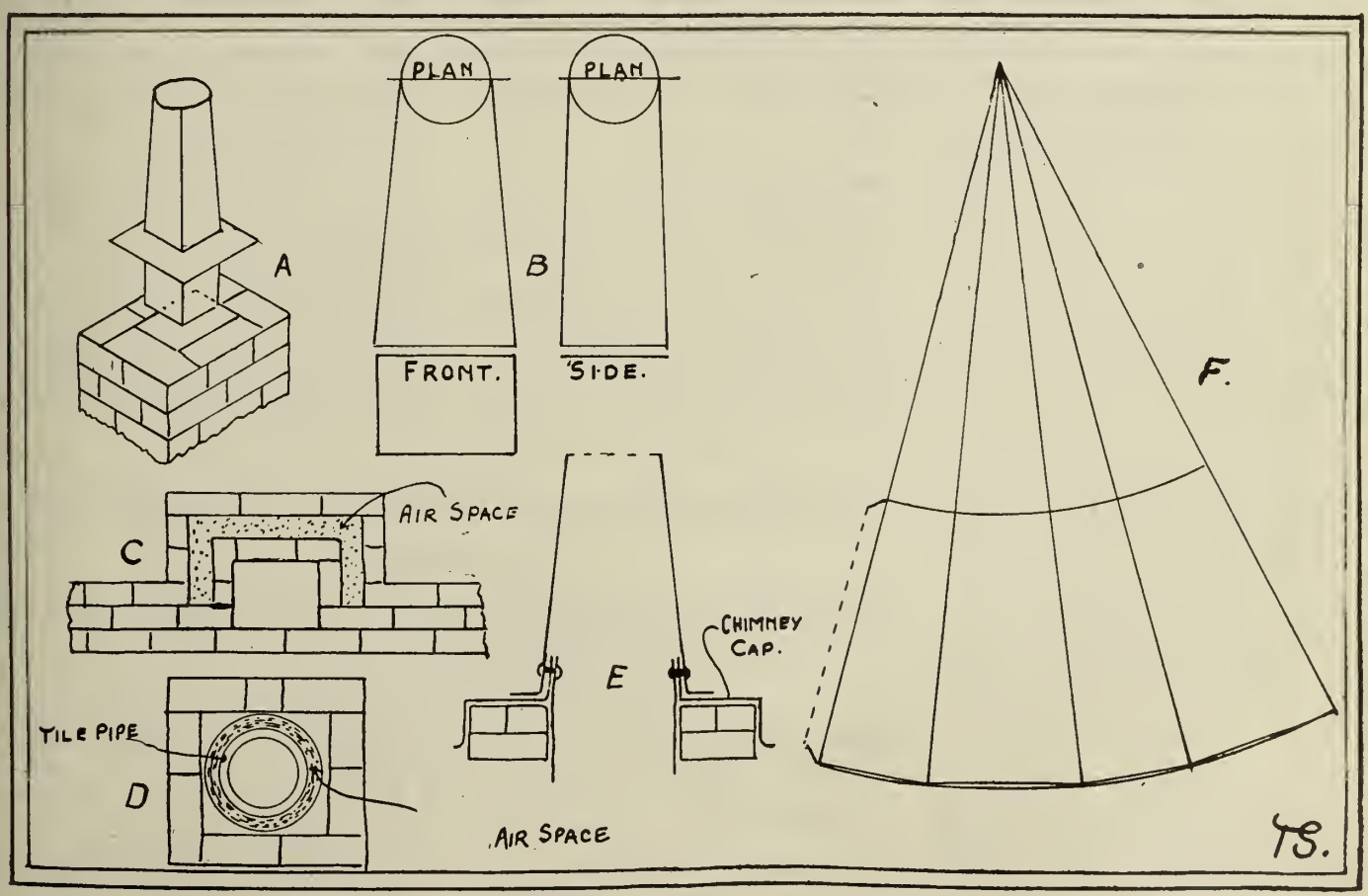
An air space or asbestos coating should be by rights inserted in such a chimney and it would result in better draft and less fuel consumption. Fig. D shows another design of chimney which is a very effective one, and one that is becoming very popular. It is a well-known fact that a round chimney is much more efficient than either a square or rectangular one.

Then again with a round pipe chimney that is smooth as well as furnished with an air chamber its effectiveness is greatly increased as stated before when an iron extension is placed on top. In this case there should be some protection for the brickwork, because winds and vibration caused by heavy traffic, etc., will very often cause the top layers of masonry to become loose. Fig. E shows how a chimney may be protected.

Fig. F is a full pattern of extension pipe shown in Figs. A and B, and is self-explanatory.

In conclusion the writer is of the opinion that one of the most important conditions precedent to a furnace being installed is to be thoroughly satisfied that the chimney is suitable for the furnace, and seeing that this work is done long before the furnace is installed, it is often necessary to decide upon the style of furnace before the chimney is built.

One very common trouble with furnaces, no matter of what kind, hot water or steam, is very often traced to poor chimneys. Sometimes they are not



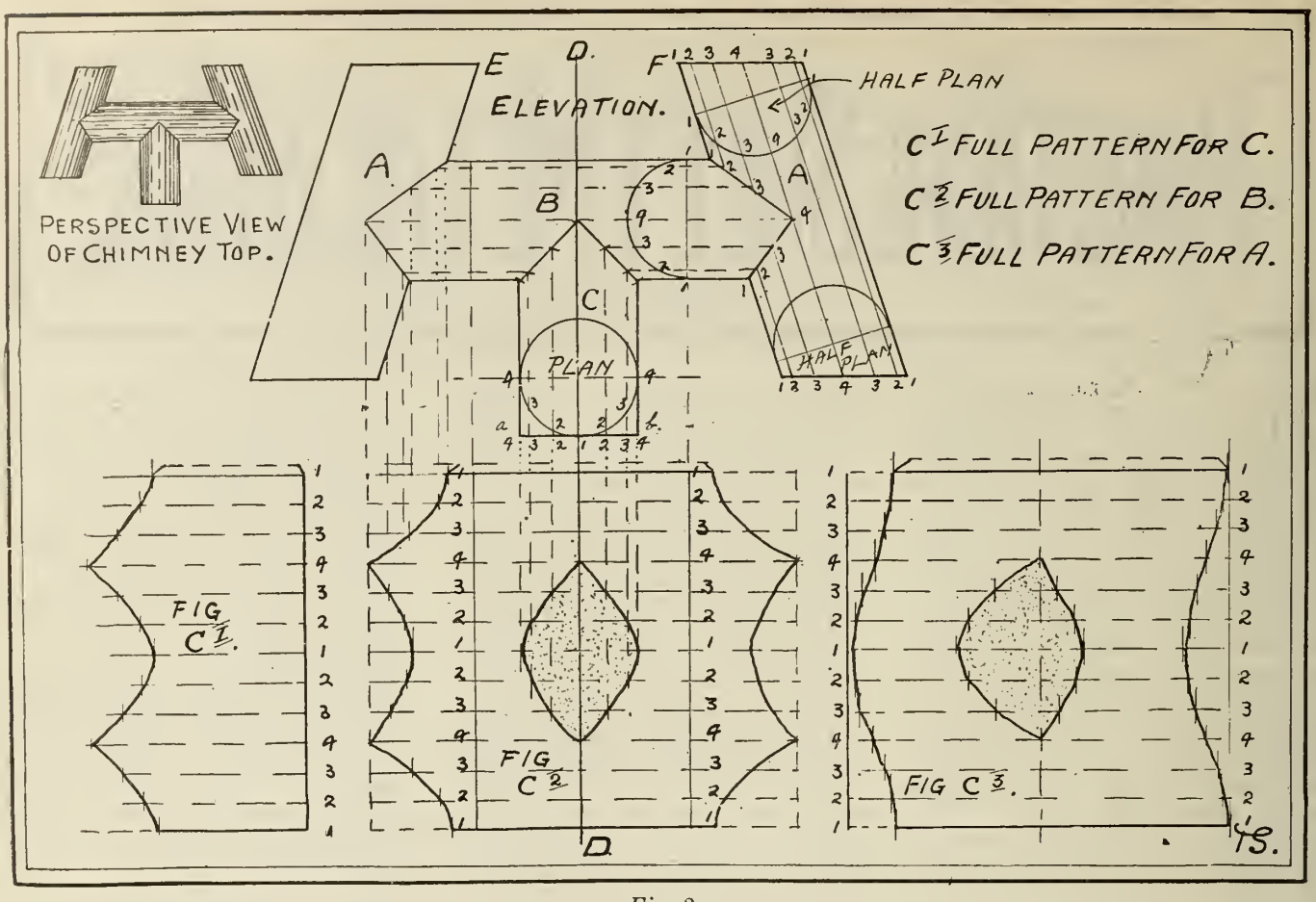


Fig. 2

properly built, not large enough or have some obstruction at or near the roof.

Many times it has been found that a taller building has been erected possibly after the furnace has been in operation, or it may be that the taller structure was first built.

The chimney top here described in Fig. 2 and for which patterns are to be developed has proved very satisfactory. The first the writer constructed was required owing to the fact that a tall building was built nearby after the furnace had been in operation for several years, and up to that time had given splendid service, but when the taller building was erected trouble began.

Since then several of the tops described have been fitted up to existing chimneys, and have resulted in a great improvement.

The principle of this chimney top is that when a wind blows even against the taller building the draft is forced through the pipes AA either up or down and in any case this draft causes a suction on horizontal pipe B, and prevents a down draft. As to size, the pipes should all be the same diameter.

In developing the patterns, the elevation and plan is first drawn as shown. Pipe C enters the chimney and may be fitted to a square to round piece which should not have less cubic contents than C.

Next divide plans of each pipe as shown into twelve equal parts, using only the four figures 1, 2, 3, 4, and repeating same. Next draw a vertical line DD, through centre of pipe C and B, which should be the true centre of the elevation. Now determine the diameter of chimney top. The length of pipes A should never be less than three times their diameter, four times is preferable, and the distance between point EF should never be less than the proportions shown, say one and seven-eighths of the diameter with a pitch of about 60 degrees.

It will be noted that as all pipes are equal in diameter the eight mitres are all in the centre of each pipe, therefore, it would be well to centre each pipe, draw three half plans of A and B and full plan of C, then draw the mitres.

Next draw dotted lines through the half and full plans at points 1, 2, 3, 4, 3, 2, 1, cutting each mitre as shown, all lines of which must be parallel with the outlines of the elevation.

Next draw a vertical line as shown in Fig. C¹ and divide it off into twelve equal parts 1, 2, 3, 4, 3, etc., from these points draw as many horizontal lines. Next take the compass and transfer the measurements from line a b in pipe C, and mitre, C, B, to the stretchout line, Fig. C¹, cutting each of the dotted lines which bear their corresponding figures. By connecting these points the pattern for pipe C is developed.

The patterns for Figs. C² and C³ are developed in a similar manner, as also are the holes in the various patterns. The one stretchout line can be used as in the case of Fig. C¹. Allowance must be made for joining the mitres, but the pattern of the hole is well to be cut a little small at first, because it can always be fitted, whereas if cut too large there is nothing but making up another piece that will do. The joints of such a top must always be tight so as to make it as effective as possible.

Test Case May be Made Out of Charge Laid at Stratford

Hardware Dealer is Convicted and Fined Nominal Sum for Breach of the Plumbing By-Law—Fine is Paid, But Under Protest

A CASE which has aroused considerable interest in Stratford, Ont., was heard before J. A. Makins, P. M., in conection with an alleged breach of the plumbing by-law.

The Stratford "Beacon" says:

In the police court this morning Mr. B. F. Kastner was convicted and fined $1 and costs for a breach of the Plumbing By-law. Mr. Kastner, who conducts a hardware store on Wellington street, sold a washing machine and coal oil stove to a Mrs. Vipend, Caledonia street. One of his employees who looks after any repairs, delivered the articles, and as the

coal oil stove was to replace the coal stove, to which the hot water pipes were attached, Mrs. Vipend asked John Redding, who worked for Mr. Kastner, if he could change the pipes, from the coal stove to the furnace. This, Mr. Redding consented to do, not thinking it was a breach of the plumbing by-law. Building inspector Dixon was advised of this and investigated the matter with the result that Mr. Kastner was prosecuted.

Several witnesses were examined, including Harry Peter, who is a plumber and gave evidence that the work done by Mr. Redding came under the head of plumbing.

Mr. Redding was called and stated that this was the first job of this nature which he had done, but he did not believe it to be a plumbing job.

Mr. Kastner was the only witness for the defence. He stated that he was not a plumber, and he knew nothing about the job in question. "Mr. Redding," he said, "had charge of the repair work, but I gave him instructions not to do any plumbing work."

In summing up the evidence, Magistrate Makins came to the conclusion that the case was a breach of the by-law, but believed that it had been done unintentionally. The Building Department did not wish a heavy penalty imposed, but merely wanted a ruling on the case. The Magistrate therefore imposed the above fine.

Mr. F. H. Thompson, K.C., who appeared for the defendant, asked for a certified copy of the evidence as he intended to test the case further. The fine was paid under protest.

W. G. Owens, city solicitor, represented the city.

Asked, following the case, whether he intended to take out a plumbing license, Mr. Kastner replied, "No, if I am going to be brought to police court for the business I am running, I am going out of business."

MARKET CONDITIONS

Continued from page 36

tations of 10c to 10½c per pound over those prevailing seven days ago.

LEAD—The buying movement is very pronounced and the market rules with decided strength. An advance is shown in quotations this week, which now range from 7c to 7½c per pound.

ANTIMONY—There has been no actual price change recorded in the quotation of 10c per pound. The market, however, is firm, and a very good volume of business is being done.

ALUMINUM—Market changes are absent, with the price of 35c per pound still considered good. A little better movement is constantly apparent.

Not An Exclusive Report

DESPITE *the fact that* SANITARY ENGINEER, PLUMBER AND STEAMFITTER OF CANADA, *published a complete report of the big Montreal Convention almost two weeks before any other paper, one of our contemporaries came out almost two weeks after our report appeared, and stated that its report was "the official report furnished by the Society, exclusively to our contemporary."*

It was no doubt obvious to our readers in all parts of Canada that the complete report of SANITARY ENGINEER *published in advance of other papers was the first authentic report received by them. In order to prove, however, that there was no such thing as an official report furnished exclusively to a contemporary, we are going to reproduce letters from officers of the Association as follows:*

LETTER FROM PAST PRESIDENT

The Sanitary Engineer,
128 Bleury St.,
Montreal.

Gentlemen:—

Your letter of July 5, regarding report of the Convention received.

The only reports of the Dominion Convention of the C. S. of D. S. & H. E. given out are those which you have received and which were prepared by the convention stenographer. No authority was given by the Society to anyone to use the word "Exclusive" in connection with the reports. The representatives of the Plumbing Trade Journals have all been treated in the same manner.

We cannot thank you too much for the reports appearing in "Sanitary Engineer" of June 15. These are very complete and there have been many expressions of satisfaction here in Montreal from the Master Plumbers; especially is this case with our French-speaking members.

Yours truly,
A. Charette,
Past President of C.S. of D.S. & H.E.

LETTER FROM THE PRESIDENT OF DOMINION ASSOCIATION

The Sanitary Engineer,
143 University Ave., City.

Gentlemen:—

I thank you for drawing my attention to the fact that one of the trade papers is using the word "exclusively" in reference to our Convention proceedings. You can rest assured that it was not our intention to give any one paper that place of honor, and if so, I can assure you that we would not be so short-sighted as to throw down our old friend "Sanitary Engineer," which has in my opinion been the best friend that we ever had. You can make use of this which ever way you think necessary.

Yours very truly,
F. R. Maxwell.

Market Conditions and Tendencies

Statements Regarding Supplies and Trend of Prices

THE MARKETS AT A GLANCE

AS predicted in the last issue of SANITARY ENGINEER, new and higher quotations are now in effect on many lines of brass goods. The advances range from eight to ten per cent. above former figures. In a few lines the quotations have not yet been announced, but it is stated that they will be higher. These increases all centre around higher prices of copper and increased wages is also a factor, it is stated.

New and higher prices are also named on two sizes of range boilers only, the thirty-five gallon and forty gallon, both standard and extra heavy. Quotations on all other sizes show no change.

In Toronto an early termination of the long standing strike of the metal workers is expected and with the return to work of some six thousand men and the resumption of manufacturing activity, it should not be long before the acute scarcity which exists in some lines should be relieved. It is practically impossible to obtain soil pipe or fittings. With any amount of business offering the situation grows worse every day. There is nothing yet to indicate what the basis of settlement will be, but it is generally expected that there will be a wage increase and shorter hours. One estimate of the advance in prices this will cause is ten per cent.

Some manufacturers are predicting a scarcity of enamelware. It is impossible, they state, to get unskilled labor for certain classes of work and production is being kept back as a result.

In general business is reported excellent, especially in the building trades. Each week sees a steady growth in the permits and many of the larger projects which will swell the figures greatly are developing. Continued activity for some time will be necessary, it is expected, to meet the need for housing accommodation.

TORONTO, August 2—All lines of brass goods are moving to higher levels and the changes that are already in effect show advances of from eight to ten per cent. over former quotations. Further additions to the list will be made shortly. For no particular reason apparently prices have been advanced on the 35 and 40-gallon sizes of range boilers, both standard and extra heavy. It is generally expected that prices of soil pipe and fittings will be revised upward shortly. There is an acute scarcity in several of these lines at present as a result of the metal workers' strike. An early settlement of the trouble is in sight, but if shorter days are granted and increased wages it will mean, it is expected, that prices will increase at least ten per cent. Considerable interest is being shown in the trade generally in the statements made at Ottawa by Dr. McFall, the Cost of Living Commissioner, regarding prices that are being charged. Further details regarding this will be found on another page of this issue.

No Changes Shown in Enamelware Prices

ENAMELWARE—Prices of enamelware are holding firmly and some manufacturers predict a scarcity of goods. It is practically impossible, they say, to obtain unskilled labor for some lines of work. A god volume of business is being handled and reports indicate that building activity is general all over the Dominion. A number of fairly large projects are developing and the outlook is for a steady demand through the fall months. Quotations on a number of the well-konwn lines are as follows:

Bath tubs, rill rim, 4, 4½, 5 feet, 24 to 30 in. wide		$35 30
Bath tubs, 5½ ft.		39 25
Basins, flat back, 14 x 15 in.		6 80
Do., corner, 15 in.		7 50
Sinks, roll rim, 18 x 30 in.		15 80
Sinks, flat rim, 20 x 30	$6 77	6.65
Do., 18 x 30	5 80	5 99
Do., 18 x 24	5 37	5 25
Do., 16 x 24	5 17	5 05
Do., 14 x 20	4 45	....
Closets, oak tank and seat	....	25 50
Do., enamel iron or white vitro tank	....	27 50

Four Advances Made in Prices of Range Boilers

RANGE BOILERS—Thirty-five and forty-gallon range boilers have been advanced, the new quotations being $13.50 for 35-gallon standard, $15.50 for 35-gallon extra heavy, $13.50 for forty-gallon standard and $1725 for forty-gallon extra heavy. Prices on the other sizes are holding unchanged. A good volume of business is being handled and prospects are that there will be a steady demand for range boilers for some time as there are a great many dwellings to be erected before the acute shortage at present existing at many points is relieved. Quotations are as follows:

Range Boilers	Standard	Extra Heavy
30-gallon	$11 00	$12 50
35-gallon	13 50	15 50
40-gallon	15 25	17 25
52-gallon	20 50	25 00
66-gallon	32 00	38 00
82-gallon	40 00	47 00
100-gallon	50 00	58 00
120-gallon	60 00	67 00

Soil Pipe Scarce, Advances Expected

SOIL PIPE, FITTINGS—There is every prospect of a settlement of the metal workers' strike and the resumption of manufacturing in lines which have been tied up for many weeks, with the results that stocks are lower than they have ever been. With a good volume of business offering manufacturers have been wondering where they are going to get the goods. One jobber stated that he has orders for goods for eight hundred houses and that it is impossible to make shipments in many cases. Resumption of manufacturing is expected to result in higher costs of production and this will mean advances in all lines. Quotations at present are as follows:

Medium and extra heavy soil pipe, 2, 3 5 and 6 in.	20%
Medium and extra heavy soil pipe, 4 in.	25%
Medium and extra heavy soil pipe, 2 in. to 6 in.	35%
8 in. extra heavy pipe and fittings	15%

PIPE FITTINGS

Cast iron fittings	20%
Plugs	35%
Bushings	35%
Unions, ¼" to 2½"	50%
Do., ⅛", 3" and larger	45%
Dart unions, ¼-inch to 2-inch	25%
Do., 2½-inch and larger	15%
Nipples, up to 4-inch	80%
Do., 4½-inch and larger	70%
Do., running thread 4-in. and under	50%
Couplings, 4-in. and under	40%
Do., 4½-in. and larger	20%

MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittings, Class A, lb.	$0 50	$0 60
Do., Class B, lb. net	0 22	0 30
Do., Class C, lb. net	0 14	0 21

10 *Per Cent. Advance in Brass Steam Goods*

VALVES—Prices which are from eight to ten per cent. in advance of former quotations are now in effect on brass steam goods. The new figures

W H O

STOOD BY THE PLUMBERS OF CANADA during the war and furnished them with goods during the most critical situation in the history of the trade?

NOT ONLY MADE MUNITIONS IN SUCH large quantities that an endless stream of shells was sent overseas to the men in the first line of defense, but kept on turning out Made-in-Canada quality plumbing brass goods for the Canadian trade?

NOT ONLY WAS THE FIRST FIRM in Canada to oversubscribe their quota in the Victory Loan of 1918, but also supplied plumbing goods needed by the Canadian merchants?

NOT ONLY DID THEIR BIT FOR THEIR COUNTRY at war, but fulfilled their obligations to their customers in Canada at the same time?

THE
H. MUELLER MANUFACTURING CO., LTD.
SARNIA, CANADA

We make Bibbs | Compression
Rapidac (quick comp.)
Self-Closing | **Basin Cocks,**

Bath Cocks, Bath Supplies, Basin Supplies, Sill Cocks, Wash Tray Bibbs, Curb Cocks, Corporation Cocks, Tapping Machines, Service Clamps, Ferrules, Regulators, Reducing Valves, Relief Valves, Water Strainers, Bubbling Fountains, Gas Cocks, Globe Valves, Forgings in Brass and Aluminum, Special Castings.

have not been received yet on two or three lines, but they will be higher. The advances centre around the higher prices now being asked for copper and also increasing labor costs. Business has only been fair as a result of cancellation of orders from overseas points for equipment on which brass specialties would be required. The home trade, it is reported, shows greatly increased activity. Marine orders at present are a little quiet. Quotations on brass goods are as follows:

Compression work, standard	44
High grade	40
Fuller work, standard	40
Basin cocks, No. 0 standard	35
Nos. 1 and 2	35
Bath cocks, compression	45
Bath cocks, Fuller	40
Flatway stop and waste cocks, standard	44
Roundway stop and waste cocks, standard	44
Brass steam cocks, standard	Net List
Globe, angle and check valves, standard.	23%
Do., removable disc	22%
Radiator valves, standard	31%
Do., removable disc	Net List
Basin Cocks—	
No. 0 and 1, Fuller pattern	40
Compression	35
Quick opening	45
Globe, angle and check valves, standard, medium pressure	23%
Radiator valves, standard med. pressure	31%
Radiator valves, removable seat, medium pressure	25

Wrought Pipe Prices Are Holding Firmly

WROUGHT PIPE—In some quarters advances are looked for in wrought pipe. No changes, however, have occurred so far. A good volume of business is being handled and manufacturers and jobbers state that the outlook is for a good trade all season. Quotations are as follows:

WROUGHT PIPE

Price List No. 40, July 4, 1919

Standard Buttweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
⅛ in.	$ 6 00	$ 8 00	$.....	$.....
¼ in.	4 53	6 66	5 13	7 26
⅜ in.	4 53	6 66	5 13	7 26
¾ in.	5 99	7 57	6 84	8 42
½ in.	7 53	9 66	8 68	10 81
1 in.	11 14	14 28	12 84	15 98
1¼ in.	15 07	19 32	17 37	21 62
1½ in.	18 01	23 10	20 76	25 85
2 in.	24 24	31 08	27 94	34 78
2½ in.	38 90	49 73	.....	.....
3 in.	50 87	65 03	.....	.....
3½ in.	64 86	81 88	.....	.....
in.	76 85	97 01	.....	.....

Standard Lapweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
2 in.	$ 27 94	$ 34 78	$ 31 64	$ 38 11
2½ in.	40 66	51 48	46 51	57 33
3 in.	53 17	67 32	60 82	74 97
3½ in.	66 70	83 72	75 90	92 92
4 in.	79 03	99 19	89 93	110 09
4½ in.	88 00	113 00	107 00	132 00
5 in.	103 00	132 00	125 00	154 00
6 in.	133 00	171 00	162 00	200 00
7 in.	175 00	224 00	211 00	259 00
8L in.	184 00	235 00	221 00	273 00
9 in.	254 00	324 00	305 00	376 00
10L in.	235 00	301 00	283 00	349 00
10 in.	303 00	387 00	365 00	449 00

Terms, 2% 30 days, approved credit.

Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

No Changes Shown in Boiler Tube Prices

BOILER TUBES—Business in tubes hsa been only fair, but an improvement is looked for. Prices are holding without change as follows:

BOILER TUBES—	Seamless	Lapweld
1¼ inch	$27 00	$.....
1½ inch	28 00	.....
1¾ inch	30 00	26 00
2 inch	30 00	26 00
2¼ inch	33 00	28 00
2½ inch	40 00	32 00
3 inch	46 00	38 00
3¼ inch	.....	45 00
3½ inch	56 00	42 00
4 inch	70 00	54 00

Cotton Waste is Somewhat Easier

WASTE, OAKUM—Some changes are shown in the quotations on cotton waste with oakum unchanged. Business has been inclined to be quiet, but with an early settlement of the metal workers' strike in prospect an increased demand is likely. Cotton waste prices are: XXX, 18c per pound; XX, 16¾c; X, 15¾c; XC, 13½c; Japanese, 13c; those ruling on colored waste are: No. 5, 13¾c per pound; No. 1, 12¾c; No. 7, 11¾c; No. 1A, 10¾c; No. 1B, 9¾c.

Quotations on oakum are:

	Per 100 lbs.
Best American	$21 00 $22 00
Clipper, spun	..... 21 00
Do., unspun	..... 10 50
Plumbers' spun	..... 9 50

Sheet Very Firm; May Advance Soon

SHEETS, PLATES—There is a much firmer tone to the market on sheets and the possibility of either a strike or a scale of increased wages in the mills the first of the month provides an element of uncertainty hard to gauge. In the first case it will mean deliveries will be slowed up, and in the second probably higher prices. Business has been showing decided improvement and the possibility of being tied up for material by a strike is not a pleasant outlook. In the meantime prices are well maintained with a move upward a possibility.

14 gauge	4 85	5 10
16 gauge	4 95	5 20
18-20 gauge	5 80	....
22-24 gauge	5 85	....
26 gauge	5 90	....
28 gauge	6 00	....
3-16 inch plate	4 90	6 25
¼-inch boiler plate	4 50	5 80

Prices shown are for full cases. An extra charge of from 25c per 100 lbs. is made for less than case lots.

GALVANIZED SHEETS.

10¾ oz.	$7 80	$8 10
U.S. 28	7 40	7 70
U.S. 26	7 10	7 40
22 and 24	6 95	7 25
18 and 20	6 80	7 10
16	6 65	6 95
12 and 14	6 50	6 80

An extra is now charged on galvanized sheets, 10¾ oz. and 28 ga., when shipped out in sheets 3 feet wide. The extra charged over prices shown above is 20c per 100 pounds. Other gauges show no change for different widths.

Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

Market Very Firm For Lead and Zinc Lines

LEAD AND ZINC PRODUCTS—The market for lead is very firm and steady and advances may be made shortly. In the meantime prices show no change. A good volume of business is being handled and it shows every indication of increasing. Quotations are as follows:

Lead pipe, list, per lb.	$0 12½
Lead waste pipe, list, per lb.	0 13½
Do., over 8 inches, list, per lb.	0 14½
Above subject to discount of 10%.	
Lead traps and bends	15%
Lead wool, lb.	0 11 0 12½
Lead sheets, 4 to 6 lbs., sq. ft., in rolls, lb.	0 12 0 13
Cut sheets ½ to ¾c lb. extra and cut sheets to size, 1c lb. extra.	
Solder, guaranteed, lb.	$0 35 0 37
Solder, strictly, lb.	0 34 0 35
Solder, commercial, lb.	0 32 0 33
Solder, wiping, lb.	0 31 0 33
Solder, wire, lb.	0 35 0 40
Zinc sheets, per lb.	0 17

Old Materials Active and Prices Very Firm

OLD MATERIALS—With copper, lead and other materials increasing in value there is great activity in these lines in old materials. In fact all lines of scrap are showing increased activity and the market is much firmer. Light copper is marked up from 12 to 13¾, crucible from 15 to 18. Similar increases are noticed in heavy copper and copper wire. According to one dealer there is a much better feeling in the market, no matter how you look at it. There seems to be a conviction that things have definitely turned for the better. Business is good, and when we say that we mean just exactly what we say. We are both buying and selling in good volume. Foundries and mills in this country are taking on material more than for some time past. As far as the increases in copper are concerned there is a feeling that Germany will be in the market for a lot of this material and there is no danger of her dominating the situation. "The scrap metal market is better right now than it has been for a long time past," he concluded. Prices are as follows:

Dealers' Buying Prices—		
Tea lead	....	0 03½
Heavy lead pipe	....	0 05¼
Pipe scrap	....	6 00
Stove plate, per ton	....	13 00
No. 2 busheling	....	11 00
Yellow brass	....	0 09
Red Brass	....	0 16¾
Light brass	....	0 07
Scrap zinc	....	0 06
Heavy copper	....	0 18
Wrought iron, No. 1, per gr. ton	....	14 00
No. 1 machinery cast	....	18 00
Heavy melting steel	....	13 50

Copper, Lead, Spelter All Move Higher

INGOT METALS — Practically all along the line one can see how the increased demand which has become apparent during the last month is tending to strengthen the markets. Copper has responded very decidedly to the increased demand, and during the last week or ten days lead smelter and antimony have been ruling with a very firm undertone.

COPPER—The market has moved still higher and quotations here range from 25½ to 26c per pound. Buying has much improved, and it looks as though the accumulation of supplies, which it was feared would prove a drug on the market, will be rapidly absorbed.

TIN—No new feature marks the position of tin this week with quotations ranging from 55c to 56c per pound, unchanged figures.

SPELTER—The demand is not exceedingly large, but market maintains a firm position and an advance of ½c per pound is shown in this week's quo-

Continued on page 33

"Morrison" Gauges

Include Recording Pressure and Temperature Gauges, Blast Pressure Gauges, Standard Test Gauges, Hydraulic, Altitude and Sprinkler Alarm Gauges, Combination Water Works Gauges, Steam, Vacuum, Locomotive and Duplex Gauges, Pyrometer Gauges, Engineers' Clocks and Revolution Counters, Pressure Gauge Testers, Pyrometers for Bakers' Ovens, Thermometers for Heating Installations, Feed Water, Flue, Gas, etc.
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Limited
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OF TORONTO

Bulletin No. 4

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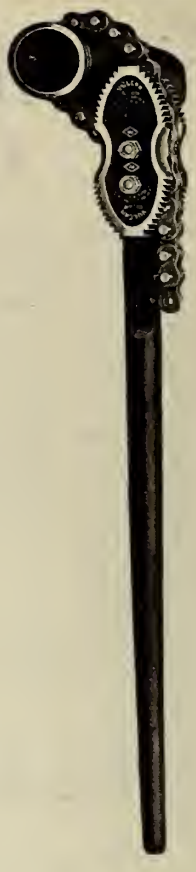
"Heat without dirt"
"Heat without odor"
"Economy Heat"

THE CONSUMERS' GAS COMPANY OF TORONTO

Building Service Bureau - Adelaide 2180

Mark of Proof Is Proof of Quality



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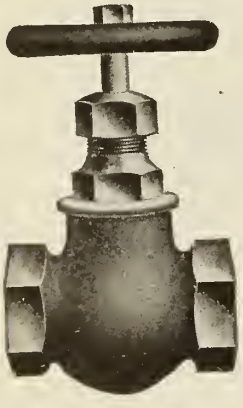

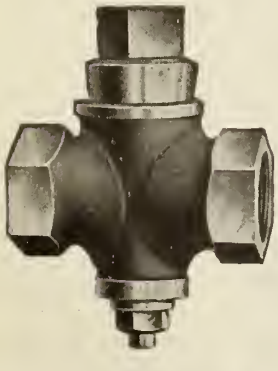

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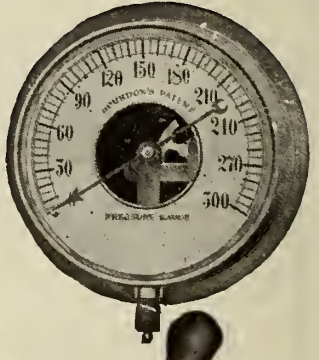

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Wm. B. Scaife & Sons Co., Oakmont, Pa.

TESTING PLUGS

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TRAPS, CAST IRON

Fittings Limited, Oshawa.

TOOLS

Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Trimont Mfg. Co., Roxbury, Mass.
Williams, J. H., & Co., Brooklyn, N.Y.

UNIONS

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Empire Mfg. Co., Ltd., London and Toronto.
Fittings Limited, Oshawa.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

VAPOR HEATING SYSTEMS

C. A. Dunham Co., Ltd., Toronto.

VITRO TANKS

Galt Brass Co., Ltd., Galt.

VACUUM SYSTEMS OF HEATING

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WATER SUPPLY TANKS

Wm. B. Scaife & Sons Co., Oakmont, Pa.

WATER SUPPLY SYSTEMS

Empire Mfg. Co., London and Toronto.

WASHERS, BUILDERS'

Fittings Limited, Oshawa.

WASHING MACHINES

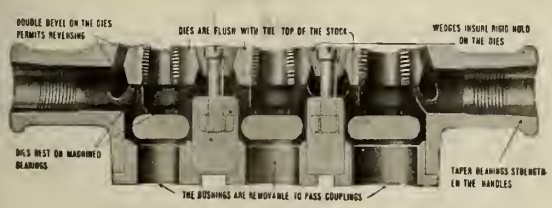
Gurney Foundry Co., Limited, Toronto.

For Easy Pipe Threading
TRY THE TRIO

Simple — Compact — Complete

3 Dies in 1 Stock

The TRIO uses Little Giant Pipe Dies with the patented double bevel which permits reversing---carries the three sizes you use most frequently. TRIO is fully adjustable.

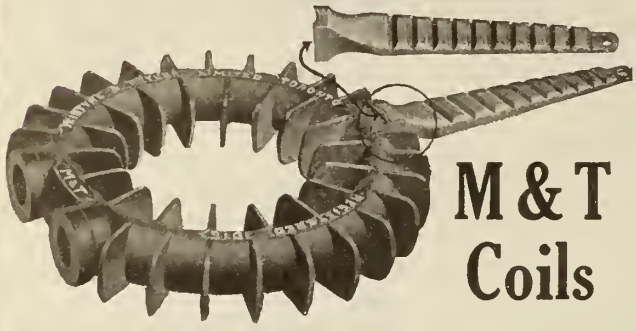

DOUBLE BEVEL ON THE DIES PERMITS REVERSING
DIES ARE FLUSH WITH THE TOP OF THE STOCK
WEDGES INSURE RIGID HOLD ON THE DIES
DIES REST ON MACHINED BEARINGS
TAPER BEARINGS STRENGTH EN THE HANDLES
THE BUSHINGS ARE REMOVABLE TO PASS COUPLINGS

Always Ready---Always Right
Ask for Catalogue

Wells Bros. Company
of Canada, Ltd., Galt, Ontario

Canadian factory of the Greenfield Tap and Die Corporation

Easily Installed



M&T Coils

This Number 15 Boiler Coil is one of the live M. & T. line. Note the large heating surface producing maximum efficiency. Size for size, M. & T. heats more water—meaning hot water at less cost.

Ask your jobber or write us direct.

Prompt shipment from stock.

McIntyre & Taylor LIMITED

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501-3 Queen St. W.

MONTREAL
55 St. Francis-Xavier St.

WINNIPEG
156 Lombard Street

ADVERTISING to be successful does not necessarily have to produce a basketful of inquiries every day.

The best advertising is the kind that leaves an indelible, ineffaceable impression of the goods advertised on the minds of the greatest possible number of probable buyers, present and future.

Introducing

ALLPRISER SERVICE

An automatic check on costs. No man in business to-day can "get by" with guesswork. Allpriser Service eliminates loss, reduces overhead, and keeps you constantly advised of costs. It puts you beyond the chance of selling a fitting for 10c that costs 12c. Such errors as this make staggering yearly aggregates.

Allpriser is a flexible leather-bound book 7 x 9, containing 150 pages (loose leaf). It is a Trade Cost book specially prepared for plumbing and heating. It includes a list showing net prices of all staple articles at a glance. Allpriser Service includes a regular service of price sheets revised to the latest changes.

This valuable service costs only $25.00 per year and soon pays for itself.

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PIPE AND THE PUBLIC WELFARE

By R. C. McWANE

A Book Just Off the Press

Every sanitary engineer should be the possessor of this book. It deals with pipe-making of all kinds, cast iron, wrought iron, steel, wood and tile pipe. It is valuable because it gives the users of pipe a true idea of how pipe lasts under various conditions when in service.

Price $1.00 Postpaid

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The Trade K–T Mark

K-T

FOUNDRY

GALT ONT.

STANDARD

Soil Pipes and Fittings are of pleasing design and good finish. They look good and they **are good**

SPECIALS

Range Boiler Stands are adjustable to 30-35-40 gallon boilers, and you can connect directly under the boiler. Inexpensive but flawless.

Your jobber can supply our goods--if you ask for them

"Wolverine"

BRASS NUTS AND SCREWS

with

Machine Cut Threads

(Hot Rolled)

Assortments

furnished in partitioned metal boxes with tweezers for easy handling

Canadian Wolverine Co., Ltd.

Chatham, Ontario

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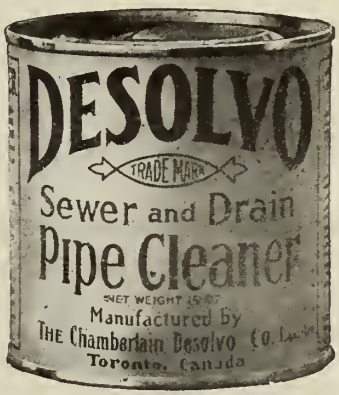

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Desolvo mixes instantly with cold water creating a high temperature that cleans out any clogged or frozen pipe. You could search a long time to find anything that will please customers more. It's good for dealers, too. Your jobber has it.

The Chamberlain Desolvo Co.

Limited

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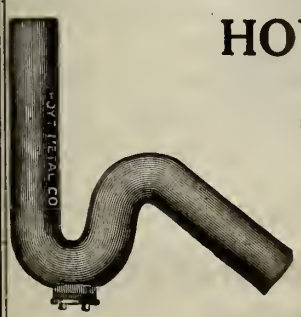
Eastern Canada Representatives: Richardson & Bureau, 55 St. Francis Xavier St., Montreal

General Offices - - - - Pittsburgh, Pa.

HOYT METAL GOODS ARE KNOWN

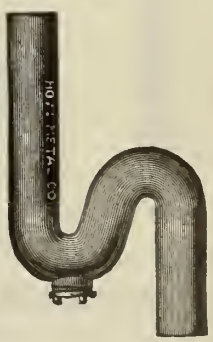
FROM COAST TO COAST



As time-savers there are none equal to our Wiping Solder, Bar or Wire Solder.

Hoyt Lead Traps, bends and waste pipe are in a class by themselves.

All our products are made to formula.



Our Mixed Metal Sales Amount To Over $5,000,000 Annually.

Write your Jobber

HOYT METAL COMPANY, TORONTO, ONTARIO

New York, N. Y., London, Eng., St. Louis, Mo.

The Complete Imperial Water Heater

BY installing "IMPERIAL" heaters, you serve your customers' interests, as well as your own.

"IMPERIAL" heaters, are made in three sizes, for the ordinary, heavier, or heaviest requirements.

PERFECT HEAT baffling. Absolute water CIRCULATION.

Sectional View Showing Water Flow

POWERFUL. ECONOMICAL.

For either ARTIFICIAL or NATURAL Gas.

IMPERIAL CITY HEATERS, LIMITED

SARNIA, CAN.

The Wrench of 25% Greater Efficiency

TRIMO PIPE WRENCH

Two new features have been recently added to the Trimo Pipe Wrench, namely Nut-Guards, in all sizes, and unbreakable steel frames, in leading sizes.

The Nut-Guards prevent the accidental rotation of the nut while in use.

These improvements add 25% to the usefulness of the tool.

The Trimo Pipe Wrench is made with wood handles in 4 sizes, 6-in., 8-in., 10-in., 14-in. and in steel handles in all sizes, 6-in. to 48-in. inclusive.

All Trimo Pipe Wrench parts are interchangeable.

The inserted jaw in the handle can be readily replaced when worn, thus adding to the life of the tool.

Nut with Nut-Guards

Inquiries from Importers and Dealers Solicited. Send for Catalogue No. 55.

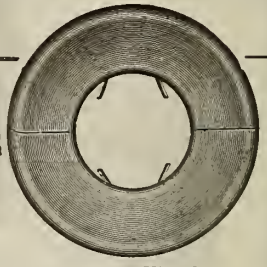
TRIMONT MANUFACTURING CO.

Cable Address: Triwrench
Code: Western Union

Roxbury (Boston) Mass., U.S.A.

OPEN VIEW NO. 10-A

The CEILING PLATE that's better



TOP VIEW NO. 10-A

THE NO. 10—A NARROW FLANGE PLATE—IS A STEEL HINGED PLATE. FLANGES ¾" WIDE. HIGHLY FINISHED. ESPECIALLY DESIGNED FOR TWIN CONNECTION "NARROW."

The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

High quality at the right price.

Gem No. 4.

Gem No. 4 Automatic Air Valve

Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

Write for catalog showing our complete line of specialties.

The BEATON & CADWELL MANUFACTURING Co.

New Britain, Conn.

Eastern Agent: J. R. Devereux & Co., 358 Beaver Hall Square, Montreal. Western Agent: A. E. Hinds & Co., Chamber of Commerce, Winnipeg.

ADVERTISING INDEX

Allison, K. B. 42
Amherst Foundry Co. ..... Inside Front Cover
Anthes Foundry Co. 46
Armstrong Mfg. Co. 48
Beaton & Cadwell 44
Beaton & Corbin 48
Borden Canadian Co. 48
Canada Metal Co. 11
Canadian Brass Co. 1
Canadian Society of Domestic Sanitary and Heating Engineers 8
Canadian Tube & Iron Co. 47
Canadian Wolverine Co. 43
Chamberlain Desolvo Co. 43
Commercial India Rubber Co. 48
Consumers Gas Co. 37
Dunham, C. A., Co., Ltd. 3
Empire Manufacturing Co. ..... Outside Front Cover
Fittings Limited 9
Gummer, G. W. G., Ltd. 2
Galt Brass Co. ..... Back Cover
Gurney Foundry Co., Ltd. 47
Hall, J. H. 47
Hamilton Stove & Heater Co. 47
Hause Mfg. Co., Chas. F. 48
Hoyt Metal Co. 43
Imperial City Heaters, Ltd. 44
International Malleable Iron Co. ..... Inside Back Cover
Jardine, A. B., & Co. 4
Jenkins Bros., Ltd. 45
Katie Foundry, The 43
Kerr Eng. Co., Ltd. ..... Inside Back Cover
McDougall & Co., R. 47
McIntyre & Taylor, Ltd. 42
Modern Heating & Engineering 3
Moline Heat 7
Morrison Brass Mfg. Co., Ltd., Jas. 37
Mueller Mfg. Co. 35
Murphy Victory Furnace Co. 7
Port Hope Sanitary Mfg. Co. 12
Scaife & Sons Co., Wm. B. 46
Standard Sanitary Mfg. Co. 5
Steel & Radiation, Limited 4
Taylor Forbes 9
Trimont Manufacturing Co. 44
Toronto Hardware Mfg. Co. 46
United Brassfounders & Engineers, Ltd. 38
Wallaceburg Brass & Iron Co. 39
Warden-King, Limited 39
Wells Bros. of Canada 41
Williams, J. H., & Co. 38

Why Jenkins Bros'. Valves Are Superior

Fig. 106

They are the original renewable Disc Valves. They have more imitators than all other makes of valves combined. They have kept pace with increasing steam pressures and severe working conditions. They are of the simplest design, and can be easily repaired by any man of ordinary intelligence. They are made interchangeable in every part, and any part can be duplicated promptly and inexpensively by the dealer. In the majority of cases they can be repaired by merely changing the disc without the laborious task of regrinding.

Fig. 108

They are recognized as the Standard Steam Valves in all parts of the World, and wherever there are supply houses—Jenkins Bros'. Valves will be found. The Standard of quality never changes except to improve, and while to-day there are hundreds of imitators, the sales of genuine Jenkins Bros'. Valves are constantly increasing.

Fig. 114

Catalogue No. 8 sent free on request.

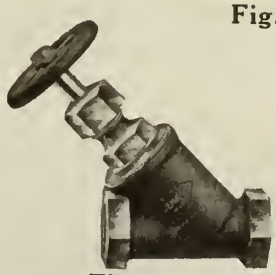


Fig. 124

HEAD OFFICE AND WORKS:
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Montreal, Canada

JENKINS BROS.
LIMITED
Agencies in all the Principal Countries of the World

EUROPEAN BRANCH:
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Kingsway, London, W.C. 2
England

Steel Tanks for Every Purpose

A FEW "SCAIFE" SPECIALTIES:

Air Receivers
Boilers—Hot Water
Expansion Tanks
Filters (water)
Hot Water Tanks
Hydro-Pneumatic Tanks
Range Boilers
Tanks (steel)
Water Supply Tanks

117 years old Founded 1802

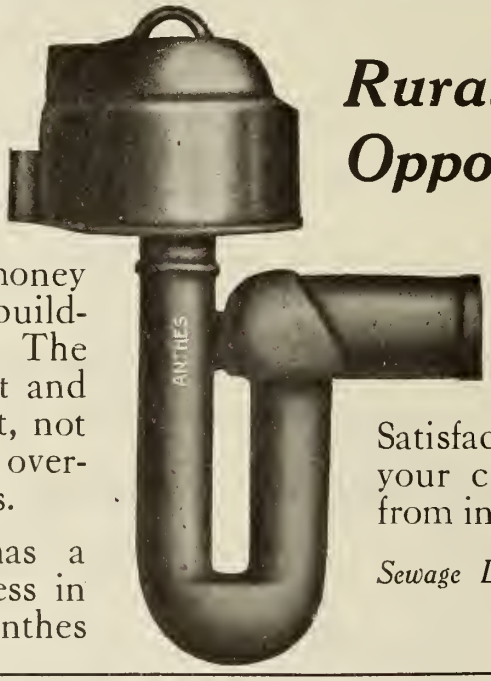
WM. B. SCAIFE & SONS CO.

New York, N.Y. Office: 26 Cortlandt St. Home Office: Pittsburgh, Pa.

Chicago: 38 South Dearborn St.

City Comfort in Rural Homes

The Plumber's Rural Opportunity



To-day there is ample money available to improve farm buildings and country homes. The difficulty of rural comfort and luxury was due in the past, not to lack of means, but in overcoming natural conditions.

The Rural Plumber has a powerful lever for business in the Anthes syphon. The Anthes is cast in one piece, has no moving parts to get out of order, and works on natural laws.

Satisfaction, and orders from your customers' friends result from installing Anthes Syphons.

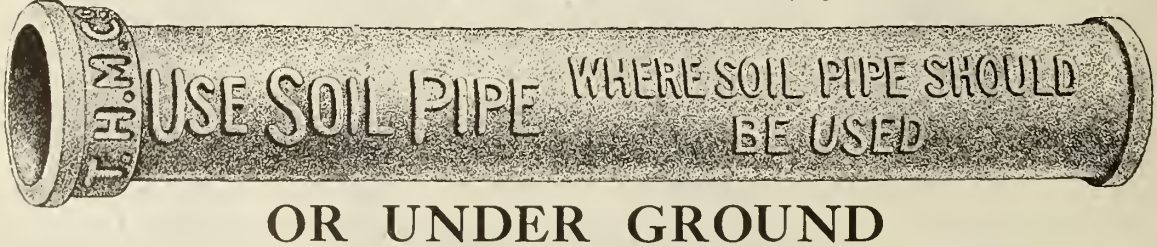
Sewage Disposal Blueprints on Request.

Prompt Shipments.

Anthes Foundry Company, Limited

TORONTO and WINNIPEG

IN THE BUILDING



OR UNDER GROUND

ASK YOUR JOBBER FOR T.H.M. CO. BRAND OF SOIL PIPE AND FITTINGS.

TORONTO HARDWARE MFG. COMPANY, - Toronto, Canada

WE MANUFACTURE A FULL LINE OF HIGH-GRADE RANGE BOILERS

WROUGHT PIPE

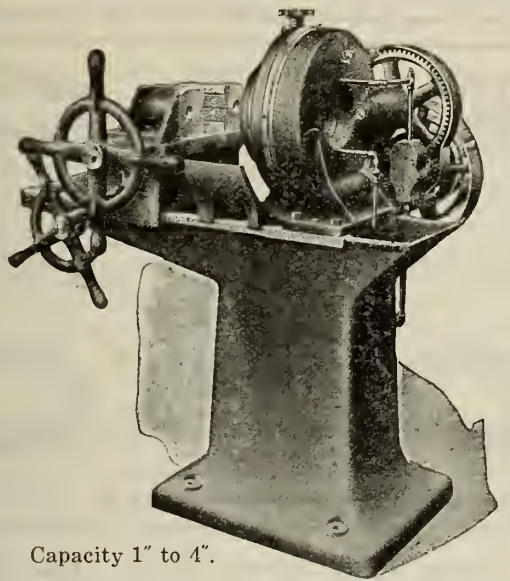
BLACK and GALVANIZED
SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

All Sizes of NIPPLES (Black and Galvanized)

Ask your jobber for CT *Brand of Wrought Pipe*

CANADIAN TUBE & IRON CO., LIMITED, MONTREAL
Works: Lachine, Can.



Capacity 1" to 4".

The Hall Simplex Improved No. 4 Pipe Machine

Easily operated by unskilled help. An ideal machine for the plumber, the steamfitter or the jobber. Will thread pipe as short as 4½ inches. Let us mail you full information regarding this money saver together with catalog covering our complete line including:

Pipe threading machines ... ⅛ to 18"
Nipple machines ..... ⅛ to 4"
Roller pipe cutters ..... ⅛ to 4"

Delivery from stock.

JOHN H. HALL & SONS, LIMITED
BRANTFORD, CANADA

FIRE ANNOUNCEMENT

We are pleased to state that the fire which occurred in our Plant on Saturday, June 21st, will not have any serious results to our customers.

We have a large stock of finished Pumps, Cylinders, etc., which were not anywhere near the fire and quantities of parts already made will enable us to take care of any needs.

Patterns are in course of manufacture, so that we anticipate no inconvenience to our customers. Advance orders are solicited.

The R. McDougall Co.
LIMITED
Galt, Ont. - Canada

GURNEY-OXFORD BOILERS RADIATORS

FOR HEATING ANY DESCRIPTION OF BUILDING BY STEAM OR HOT WATER
THE GURNEY FOUNDRY CO. LIMITED
TORONTO MONTREAL CALGARY WINNIPEG VANCOUVER

WE CARRY A FULL LINE OF-

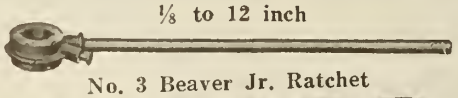
BOILERS, RADIATORS, WARM AIR FURNACES & REGISTERS.

HAMILTON STOVE AND HEATER COMPANY LIMITED.
HAMILTON CANADA.

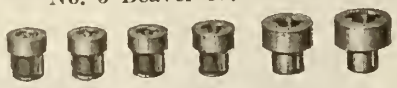
BEAVER TOOLS

For Easy Cutting

⅛ to 12 inch



No. 3 Beaver Jr. Ratchet



THE pipe-threading problem is readily solved when **Beaver Easy-Working Die Stocks** are used. They cut quicker and save labor, time and money.

They eliminate troublesome bushings and the bother of changing dies.

Beaver Threaders are easily adjusted. Simply "move the handle—that's all."

Beaver Tools are absolutely guaranteed. The user and the dealer are both protected.

Write us for descriptive circular and prices.

The Borden Canadian Company

110 Church St. - - - Toronto, Canada

GENUINE

ARMSTRONG STOCKS and DIES

Hinged Pipe Vises *Pipe Cutters*

Pipe Threading Machines

—MANUFACTURED BY—

THE ARMSTRONG MFG. Company

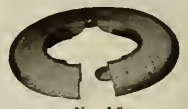
317 Knowlton Street, BRIDGEPORT, CONN

248 Canal Street, NEW YORK

"BC"

COMBINATION COLD ROLLED STEEL Floor and Ceiling PLATES

Carried by the leading supply houses



No. 15

Puts just the right finish on that heating job

Send for catalog of complete line of "B. & C." goods.

No. 1 Valve

Stock carried by our Canadian Representative W. H. CUNNINGHAM & CO. 183 Church Street Toronto, Ont.

No. 16

The Beaton & Corbin Mfg., Co. Southington, Conn., U.S.A. The Old Original Company

No. 17

WORTH WHILE PUBLICITY

The general tendency in Canada is towards selling high-grade goods. There never was a time, in the history of the country, when all branches of the Canadian trade were more interested in securing all possible information regarding products they can recommend and guarantee to their customers. Advertisers in SANITARY ENGINEER reach the cream of the trade in all parts of the Dominion.

Chas. F. Hause Mfg. Co., Ltd.

Manufacturers of the

Hause Closet Auger

Seamless brass tube—high-grade 7-16 steel spring. Made with 3-foot and 6-foot springs.

Ask your jobber or write us direct. Made in Omaha, Nebraska, U.S.A.

Canadian Distributors

Empire Mfg. Co., Ltd., London and Toronto

"VALVENE" Discs (REGISTERED)

Specially prepared for Hot and Cold Water Taps. All sizes from ½ inch to 1½ inches. Soft, Pliable, and "Joint-Perfect."

Price List and Samples on Application.

THE COMMERCIAL INDIA RUBBER MANUFACTURING & SUPPLY CO., LIMITED

SOLE MANUFACTURERS

585 Commercial Road, LONDON, E.I.

CONDENSED ADVERTISEMENTS

PLUMBING BUSINESS FOR SALE IN TORONTO, established over 30 years, capable of a thirty thousand turnover with present equipment. Stock value $7,000. Best of reasons for sale, prompt acceptance of complete sale or on only part stock basis, as immediate action is necessary. K. B. Allison, 668 Yonge St., Toronto.

FOR SALE—PLUMBERS' SUPPLIES OF ALL makes, at prices that protect the plumber. American Plumbers' Supples, 14 Craig St. West, Montreal.

Pipe Fittings

Made in Canada

The Brand that has the Quality

M Brand Pipe Fittings, etc., give a service and satisfaction that will invariably get you re-orders and much new business as well.

A trial of the goods will prove this claim.

CAST IRON FITTINGS

With this brand mean fittings made with iron of high tensile strength—proper proportions and correct tappings.

RECESSED DRAINAGE FITTINGS

MALLEABLE FITTINGS

With this brand mean fittings made of Air Furnace Refined Iron, reamed and tapped to gauge with perfect threads

Standard and Extra Heavy Flanged Fittings and Flanges. Galvanizing Malleable and Gray Iron Castings of all Kinds.

International Malleable Iron Co., Limited, Guelph, Ontario, Canada

There Are Lots of Gate Valves

Advertised and Sold

but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES

Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.

Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.

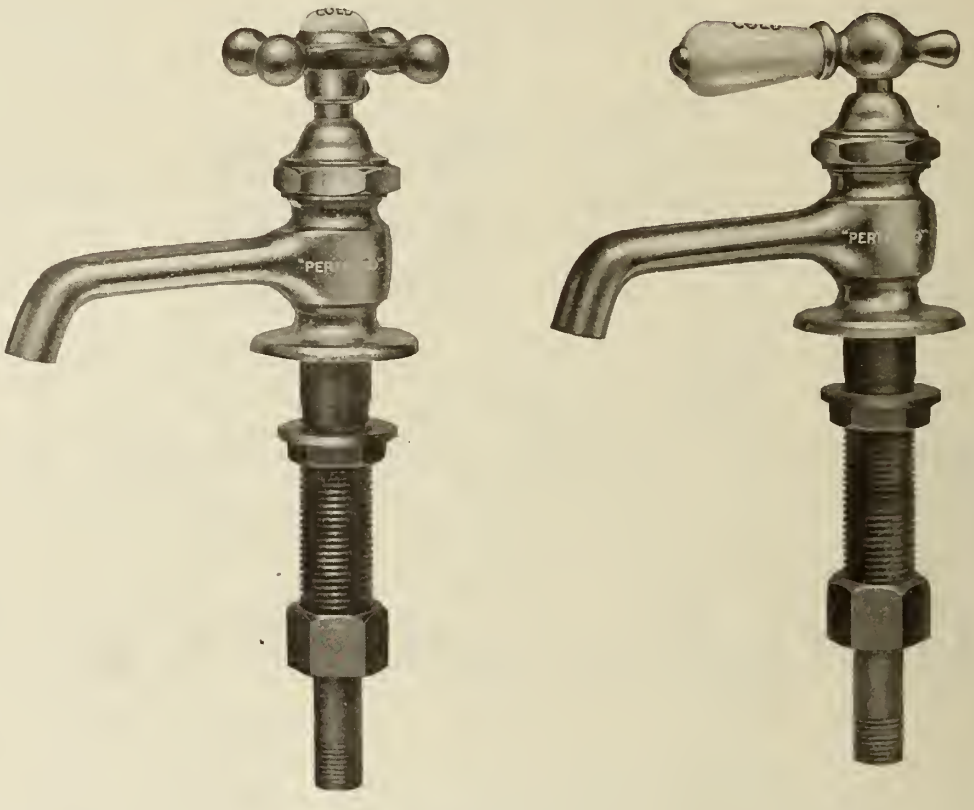
Approved by the Fire Underwriters' Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

Registered **PERFECTO** *Trade Mark*

Basin Cocks That Give *Service*

Gaining
Customers'
Confidence
Ensures
Future
Orders.
This
Bibb
Gains It.



The Famous "Two-for-One" Guarantee

"Any article of our make proving defective through inferior metal, or improper workmanship, on our part, will be replaced with *Two* good ones, at *No Charge* to you. You can't beat it."

Send us your order now

MADE IN CANADA

Galt Brass Company, Limited

GALT, ONT.

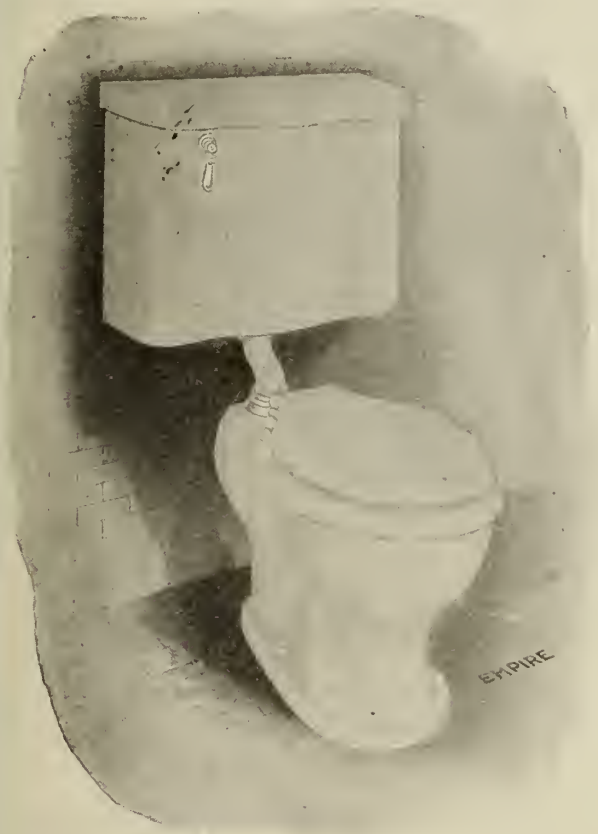
General Sales Office: 67 Adelaide St. East, Toronto, Ont.

Sanitary Engineer
Plumber and Steamfitter of Canada
VOL XIII. PUBLICATION OFFICE, TORONTO, AUGUST 15, 1919 No. 16.

"Silentic" Was a Bold Step in Naming

It is a name that stands for a guarantee of silence.

The Empire Manufacturing Company has never fallen down on a guarantee, we never will.



Silentic—Plate A 22-D. Empire Vitreous China Double Wavered Lowdown Tank white pyralin coated "Action D" and 2" white pyralin coated offset connection.

The "Silentic" is as near silent as any sanitary fixture can be. Every sanitary engineer who has installed "Silentics" is ready to back us in our guarantee.

The scores of householders who have enjoyed the freedom from embarrassment, that the "Silentic" makes possible, are our best advertisements.

But silence is not the only selling point of the "Silentic." Note its handsome snow-white appearance —no nickle to tarnish and spoil its appearance. Like all our lines of plumbing the "Silentic" meets every requirement. All our sanitary fixtures must be absolutely efficient, non-corrosive, durable, *Sanitary,* or they do not leave our factory.

Empire Manufacturing Co., Limited

London and Toronto, Canada

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While

A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for BEAVER BRAND CAST IRON ENAMEL WARE

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

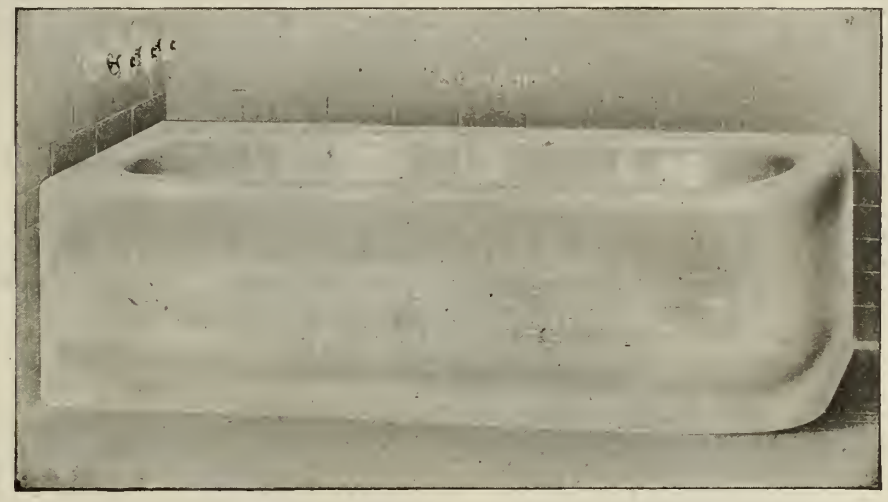
AGENCIES:

ONTARIO:
Monarch Brass Mfg. Co., 71 Brown St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes, 120 Lombard St., Winnipeg

"Standard"
"Perfection" Built-in Baths

Made in One Piece Enamelled All Over



These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in-Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners meaning bathroom sanitation.

Made in 5 and 5½ foot sizes.

Illustrations on request.

Write the nearest dealer

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Limited

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55-59 Richmond Street East

Winnipeg Showrooms:
76 Lombard Street

Hamilton Store:
20-28 Jackson Street West

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"MADE IN CANADA"

The Wonders of the Toronto Exhibition Will be Many

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THE VICTORY HOT WATER HEATER

This wonderful invention gives the modest builder of a low-priced house the opportunity of enjoying the luxury of hot water heating at a figure easily within his reach. The saving in fuel cost is remarkable and there is also no duplication of expense for a cooking range.

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A Quality Pipe Wrench—a pipe wrench you can depend on. One that grips tighter as the strain increases and positively will not slip.

"Wells" Pipe Wrench is

"Forged for Service" -- it will last a lifetime, yet it costs no more than the ordinary kind.

Ask your dealer for it or order direct from Galt.

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Company of Ltd. Galt, Ontario

Canadian Plant of the Greenfield Tap & Die Corp.

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World's Largest Manufacturers of Screw Cutting Tools.

"What Difference Does It Make?"

A Little "Straight Talk" to the Canadian Plumbing Trade

THIS QUESTION comes almost daily to the ears of many a Master Plumber who is called upon to make estimates for the heating or plumbing requirements in a new building. "What difference?" whether low grade fittings are used in the hidden and unseen portions of the work; "what difference" if cheaper or "just as good" materials are introduced to save a few dollars?

IGNORANCE IS RESPONSIBLE, very often, for the creation of conditions which bring about loss of comfort, convenience and money. The man erecting a new home or business building is not educated on the subject of plumbing equipment and he is inclined to let his contract to the low-priced man regardless of some of the most vital differences which could exist.

IT IS "UP TO" THE MASTER PLUMBER to check this tendency. If he fails in his duty and falls into the temptation of using inferior equipment, he cheats not only the customer, but himself. The plumber who insists on the use of QUALITY fittings and material will be the winner in the end and will build up a name for reliability and EFFICIENCY.

THE POSSIBILITIES ARE GREAT in this very field. In many a Canadian home the idea of a new bathroom has been a dream long considered but never acted upon. The plumber who goes out after this trade can surprise his prospect with the ease and economy with which new facilities can be installed and the discarding of old and troublesome fixtures becomes a joy when higher grade materials are introduced. The cost need not be greatly advanced because it is often a matter of the plumber's understanding where to procure the best goods at the most moderate price. Such knowledge permits him to give real SERVICE.

"QUALITY," "EFFICIENCY" and "SERVICE" make the "DIFFERENCE." Every Master Plumber should make this motto, which is the guiding principle of the CANADIAN BRASS CO., his own. This Company always stands ready to assist by advice as to costs, grading and standards of equipment, always anxious to help the plumber to realize his best desires for SERVICE and his own prosperity.

TRADE B.O.T. MARK

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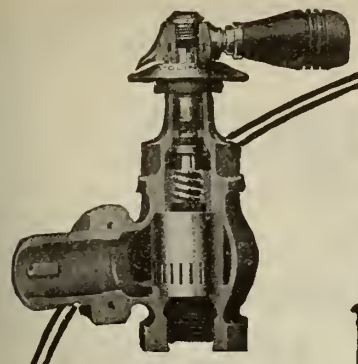

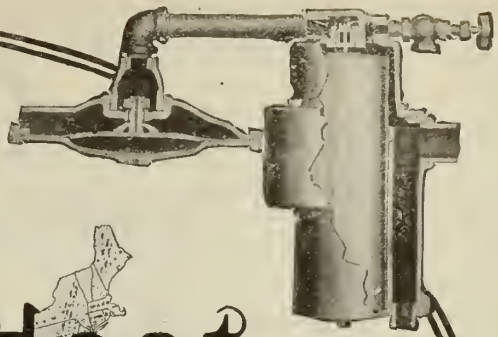

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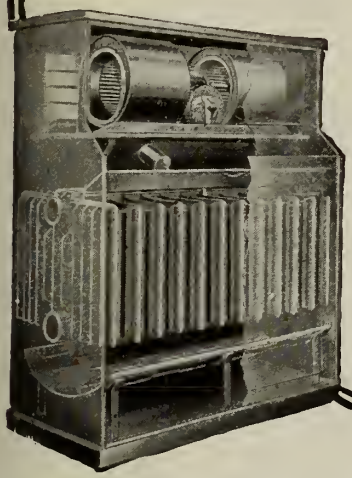

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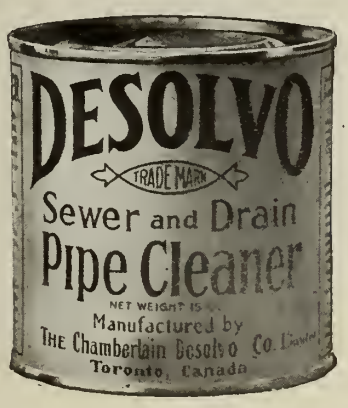

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It saves money, labor bills, tearing up the house and lawn. It clears drains. It mixes with cold water, requiring no heating and generates heat enough itself to thaw frozen pipes.

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(Hot Rolled)
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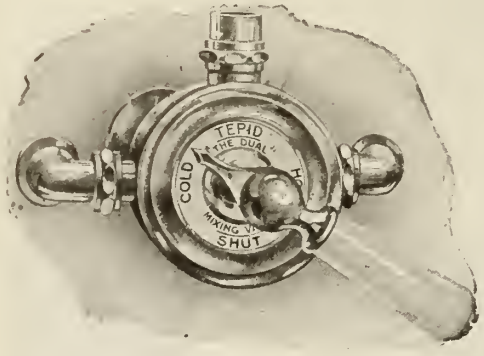

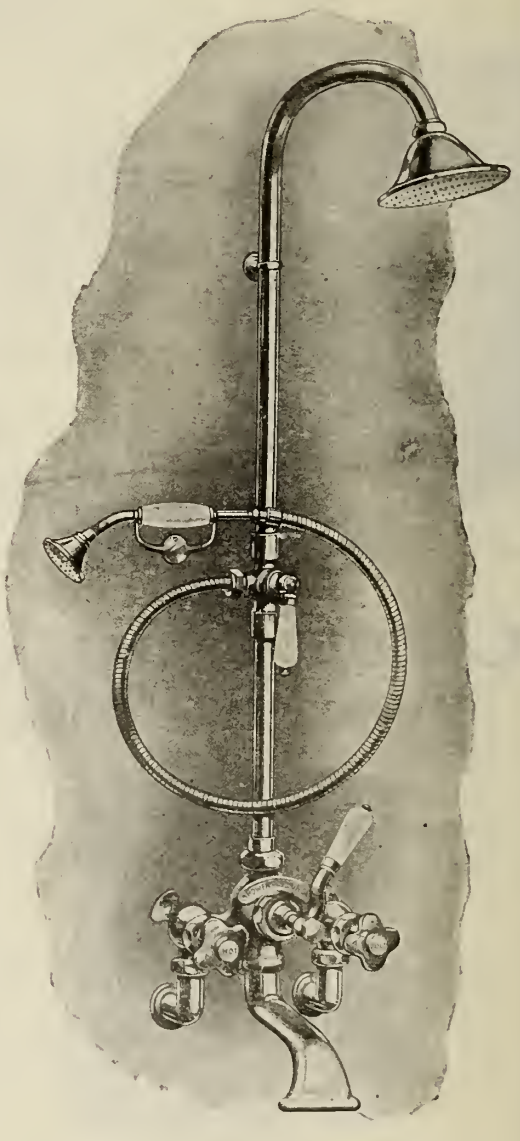

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For ease of operation, simple construction and easy installation, it has set a new standard of efficiency.

Cold Water must be turned on first, no possibility of scalding.

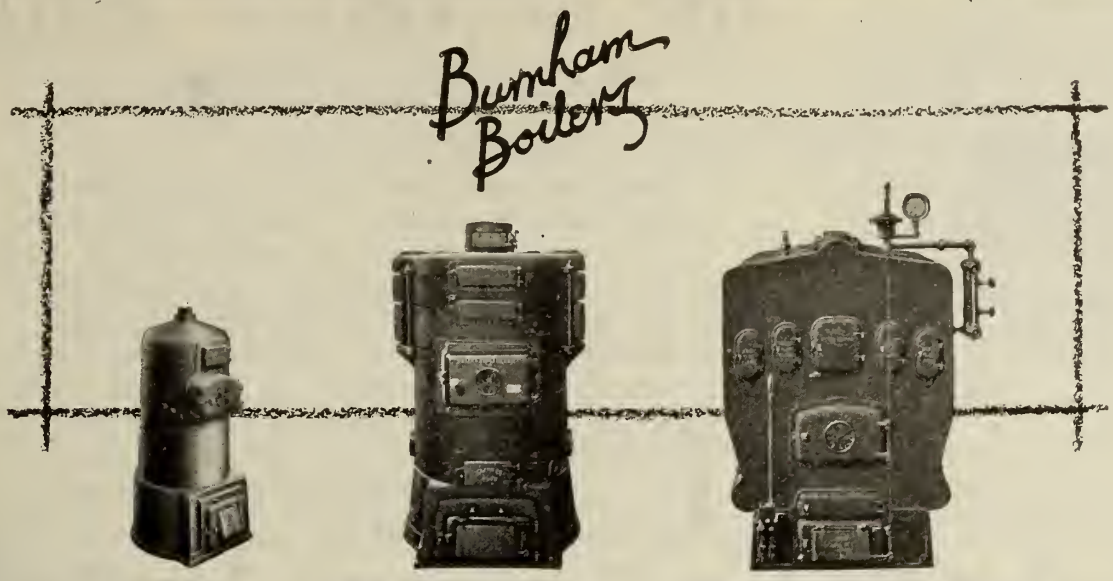
Made in several forms for Showers, Sprays, Operating Rooms, etc.

At the well-known works of Messrs. Brunner, Mond & Co. these valves provide baths for 2,500 employees.

G. & W. G. GUMMER, LIMITED

Manufacturers of every description of

Engineers,' Plumbers' and Sanitary Quality Brassware



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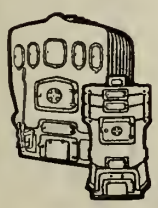
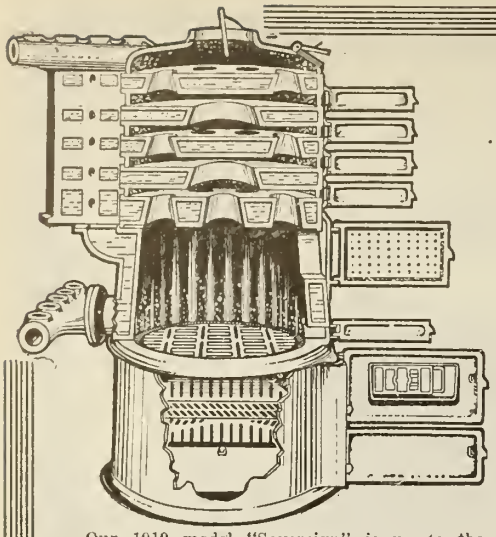
For dealers, we have a special proposition in which we are sure you will find particular interest right now.



Lord & Burnham Co. Limited of Canada
Boiler Department

ROYAL BANK BUILDING

Factory: St. Catharines, Ont.



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Obtains Double Satisfaction

Your client will share with you the satisfaction that accompanies the sale and installation of a "Sovereign." Many, indeed, are the recommendations we could make mention of from the thousands who have used and speak so highly of the efficiency and all round satisfaction so obtained. You can specify the "Sovereign" at all times and where the severest test is there will it prove your good judgment and win a reputation for you that must surely mean greater business and further success.

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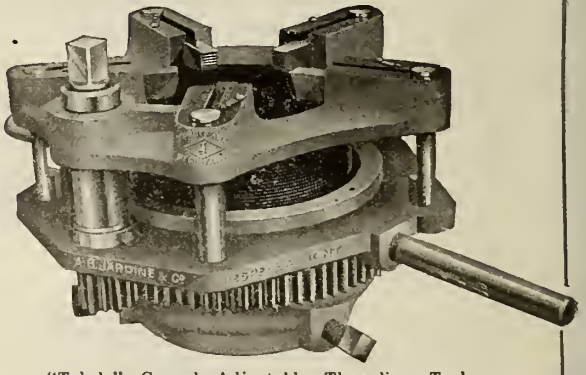
Calgary—Canadian Western Mfg. & Supply Co.
Regina, Sask.—Engineers' & Plumbers' Supply Co.

JARDINE and TOLEDO PIPE THREADING TOOLS



"Toledo" Geared Adjustable Threading Tool No. 2½. Capacity 2½ to 6 in. inclusive. Weight, 120 lbs.

THE ratchet feature of Jardine and Toledo Tools permits their being used to thread pipe which is already in place, no matter how awkward it may be to reach. The Jardine and Toledo have no cams or jim cracks to get out of order; and the dies only cut with the mouth of the cutter. Also, as the tool advances on the thread the dies open out so as to make the proper taper. This means there is no friction on the pipe and every ounce of strength is used in making the cut, so saving time and labor. These are only a few of the valuable features of these tools.

SEND FOR CATALOGUE

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Sole makers of "Jardine" Pipe-Threading Tools.
Sole licensees to manufacture and sell Toledo Pipe-Threading Tools in Canada.
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OFFICIAL BULLETIN NO. 3

OUR MEMBERSHIP

Provincial Societies will be composed of Local Societies and of individual master engineers from cities and towns where no Locals exist within their respective Provinces.

THE PROVINCE OF ALBERTA

Provincial Vice-president—James Marr, Calgary.

THE ALBERTA SOCIETY OF DOMESTIC SANITARY AND HEATING ENGINEERS.

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The craft in Alberta are urgently requested to affiliate with their Provincial Society and show that broad spirit of fellowship, for which the West is justly noted, by co-operating with one another to the end that the Sanitary and Heating Engineers of Alberta shall become 100% organized. Forward your name to Secretary-treasurer Bert Phelps, c/o Phelps Bros., Calgary, Alberta, or write to any of the above officers for particulars. Watch this page in each issue, and remember our motto—

ALL FOR ONE
and
ONE FOR ALL.

Yours for co-operation,
FRANK R. MAXWELL, President.

Addresss all Communications to
GARRETT F. FRANKLAND, Secretary-Treasurer,
Room 303, 22 College Street, TORONTO, ONTARIO

SANITARY ENGINEER
PLUMBER AND STEAMFITTER OF CANADA

ESTABLISHED 1907 PUBLISHED TWICE MONTHLY

Vol. XIII. TORONTO, AUGUST 15, 1919 No. 16

CONTENTS

Finds One Line Helps Sell Another 13-14
Provincial Board of Health Demands Complete Sewage Disposal System at Woodstock 14
Putting "Pep" Into Advertising 15
Cartage Rates Are Increased 17
Prevent Communicable Disease 18
Saving Fuel in Heating a House 19
Modern Plumbing System Installed in Memorial Hall 21
Editorial Comment 22-23
Says Association Price Prevails 24
Good Profits in Electrical Fixtures 25
Meeting To-day's Competition 26-27
Joint Freight Tariffs to Be Lower 27
News From Here and There 28-29
Question Box 30-32
Lethbridge Commissioner Urges Metering of City's Water Supply 32
Heating and Ventilating—
Hot Water Heating Systems 33-34
Ventilating the Modern School 35
Market Conditions and Tendencies 36-38

The MacLean Publishing Company, Ltd.

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Publishers of Sanitary Engineer, Hardware and Metal, The Financial Post, MacLean's Magazine, Farmers' Magazine, Canadian Grocer, Dry Goods Review, Men's Wear Review, Printer and Publisher, Bookseller and Stationer, Canadian Machinery and Manufacturing News, Power House, Canadian Foundryman, Marine Engineering of Canada, Canadian Motor, Tractor and Implement Trade Journal.

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We make

LEAD PIPE

All sizes

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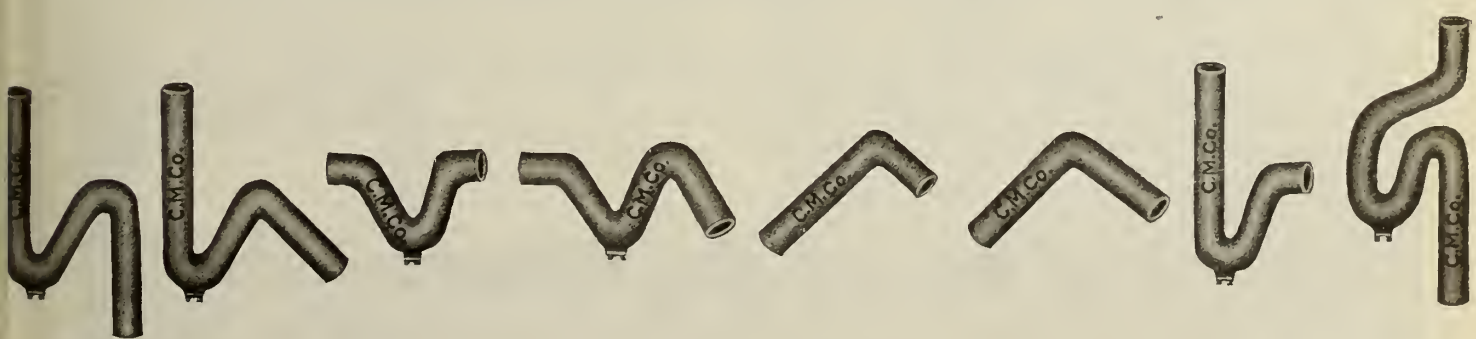

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The Canada Metal Company, Limited

HEAD OFFICE **TORONTO,** Branch Factories **MONTREAL WINNIPEG**

Visitors to the Toronto Exhibition

are invited to make our Exhibit their Headquarters. You'll find us at the eastern end of the Process Building, section one.
This year we make a specialty of Industrial and Domestic Fixtures, showing many new and attractive lines in which you will be interested.

Port Hope Sanitary Mfg. Company, Limited

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PORT HOPE, ONTARIO
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ROYAL BANK BUILDING, TORONTO
MONTREAL SHOWROOMS
234 Beaver Hall Hill

Established 1907 Circulates Throughout Canada

Sanitary Engineer
Plumber and Steamfitter of Canada

Published First and Fifteenth of Month

Vol. XIII TORONTO, AUGUST 15, 1919 No. 16

Finds One Line Helps Sell Another

D. N. Flander, of Ingersoll, Ont., Finds Selling Stoves and Tinware Helps the Plumbing Business and Keeps Himself and His Staff Busy all the Year Round—Plans to Take on More New Lines

Based on an interview by C. E. PARSONS with D. N. Flander, of Ingersoll, Ont.

"KEEP business humming" is the plan on which D. N. Flander, of Ingersoll, Ont., works. Stoves, plumbing and tinware are the foundation on which he has built so successfully that he is planning now to add a general hardware stock as well as electrical goods. In the meantime he is steadily increasing his turnover of stoves and tinware as well as looking after a plumbing trade that takes his men many miles out in the country. Ingersoll, it might be mentioned, is located right in the centre of one of the very richest dairying districts in Western Ontario. There are a number of condensers and milk factories within a few miles of the town. This naturally means that the farmers get cash for all the milk they haul in and every day they haul in large quantities. So much ready money means comfortable homes, well equipped dairy barns, up-to-date machinery and so on, and Mr. Flander is there to sell them the very best he can get in the lines he handles.

Insist on the Best

"The farmers of this district," he said to SANITARY ENGINEER, "have the money to spend and insist on having the best. If it is a stove a few dollars is neither here nor there; they want a good one. If it is plumbing, it must be the latest and the best. The same applies to tinware. Take dairy pails, for instance. Some days I sell as many as forty. I get one of the best dairy pails I can buy and then improve it by soldering around under the rim at the top. This is the point where a dairy pail always starts to go first. The farmers know this from experience. Many of them know also that the pails I sell them, soldered at the top, will outlast the others by a long way. They not only come to me for them, but they send their friends."

Keeping lots of goods out where people can see them is one of the best ways of keeping stock turning over, says D. N. Flander, of Ingersoll, Ont. Mr. Flander keeps his goods in spotless condition, and besides his shop display uses newspaper space regularly to tell the people of his district what he has to offer.

One Helps Another

Mr. Flander finds that carrying stoves and other lines helps his plumbing business. For instance not long ago a farmer came in to see about getting a stove. Mr. Flander sold him a good one and got talking to him about house improvements, bathrooms, etc., and finally sold him an outfit that cost $1,250. This is not an exceptional case at all. Mr. Flander has made many such deals.

"Stoves are one of my big lines," he stated. "The sales would average all of 200 a year. I find it a good steady business. I work on as nearly a cash basis as possible. Most of the farmers in this section are not only ready but willing to pay cash for all they buy."

Has Window Displays

As will be seen from the accompanying photo Mr. Flander keeps one of his show windows especially for stoves and the other for plumbing displays. In his store arrangement stoves are kept where everyone who comes in can see the stock and inspect it at will. On one side of the store the display of kitchenware and enamelware is made.

"The best way to keep the stock moving is to keep it out where people can see it," said Mr. Flander. "I try to keep everything as neat and attractive as possible. It makes a big difference in selling such lines as stoves and tinware. If the stoves are dusty people are quick to size up the whole store as being a second-rate affair. But if they are clean and shining and the tinware and enamelware is all looking its best they like to inspect it and most of the people who start looking things over are interested, and we sell them."

Want Combinations

"The great call lately," said Mr. Flander, in discussing his stove sales, "is for combination stoves. People want a first-class stove that will burn coal, wood or gas. I have sold a lot of these. A satisfied customer is one of our best advertisements. Many of the women who work with stoves bought in my store never tire of praising the stoves to their friends and they show them how they work and all about them. The other women naturally want a stove just as good and come in to see about them."

Mr. Flander has developed a good business in repairs of all kinds. This has grown so that now he keeps two men busy all year round doing nothing else but repairs. In a district like Ingersoll, where there is a lot of dairying equipment, such jobs as require the services of a tinsmith are frequent. There are also a lot of plumbing jobs to look after and also stove repairs to make.

Make Them Salesmen

In the plumbing repair work Mr. Flander aims to make every one of his men a salesman. If he gets a call for a repair job the man goes and looks it over and decides whether it would be best to make repairs or to install a new part. Then he reports to Mr. Flander and if, as is generally the case, the inspection shows it would be better to put in a new part than to attempt to fix the old, Mr. Flander takes the matter up with the owner.

"It is better for me and better for the owner usually to have a new part put in," said Mr. Flander. "Very often the part that needs fixing is old and worn out, and if it were fixed it would only be a short time before it would be giving trouble again. I explain all this to the owner and he can see for himself that I am advising him in his own best interests. It may cost slightly more to put in the new work, but once it is in he has a job that will not give him any trouble again for years. Most of the people understand this and appreciate any advice of this kind we give them. Very often when we suspect the job to which we are called is likely to be one in which a new part is going to be needed the man takes the part with him when he goes. I find that people almost invariably accept our recommendation as to what should be done, as they look to us to know.

Uses the Newspapers

Mr. Flander finds that newspaper advertising, backed by window and store displays, is one of the best ways of keeping his stock and his name in the minds of the public. He is a regular advertiser in the local paper and says he gets good results from his efforts. He usually uses a two column space, four inches deep.

In addition to handling 200 stoves and ranges a year, Mr. Flander has been selling from fifteen to twenty automatic oil stoves each season. He says that sales in this line are increasing. Mr. Flander in sending out stoves and ranges does not follow the plan of many dealers, that is, of putting the stove up in working order in the home. If the farmers or other buyers want the stove delivered and set up in their house Mr. Flander makes a charge for this.

APPOINTED ADVISORY ENGINEER

A. J. McPherson, of Regina, has been appointed advisory engineer to the Bureau of Public Health at Moose Jaw, Sask., in succession to the late T. A. Murray. Mr. McPherson will also act in an advisory capacity to the Local Government Board, and it is expected that, in the event of any action being taken in regard to the supplying of water to southern cities from the South Saskatchewan River, the superintendence of the scheme will be a part of Mr. McPherson's duties.

Provincial Board of Health Demands Complete Sewage Disposal System at Woodstock

IN connection with a new intercepting sewer that is planned at Woodstock, Ont., at a cost of $110,000, the Provincial Board of Health, after going into the matter has ordered that full provision must be made for the total disposal of the sewage. The original plan, as submitted by the city council for the approval of the Provincial Board of Health, did not include any provision for the disposal of the sewage, the idea being to provide first for the construction of the sewer and to leave the matter of sewage displosal for future consideration. When the plans were first submitted to the board they advised that convertible sedimentation tanks be added to the scheme.

Demand Complete System

At a later conference the provincial authorities declared, after going over the plans that it will be necessary for the city to install the activated sludge process of sewage disposal in connection with the intercepting sewage plan, and advise that the whole system be installed at the same time. The provincial authorities intimate that their approval will not be forthcoming until the complete scheme is provided for in the plans.

As it is necessary for the city to go ahead with the sewer plan without further delay, a writ already having been issued against the corporation in connection with trouble at Cedar Creek, and the added fact that this is the only way in which the approval of the Provincial Board of Health can be secured, the modified plans will be gone ahead with at once.

WILL LAY WATER MAINS

At a meeting of the Water Works Commission of St. Catharines, Ont., a by-law was passed confirming an agreement with the Township of Grantham for a water supply for domestic use in Niagara Gardens. Work on new mains will proceed shortly.

MAY CONSTRUCT BATHING POOL

In order to save the lives of children and reduce the death rate from drownings in the river, the city council at Sarnia, Ont., has under consideration a plan for the construction of a public swimming pool. Estimates of the cost are to be secured.

OFFICES IN NEW YORK

The general offices of the "X" Laboratories have been removed from Boston to 25 West 45th St., New York, and both the executive and sales departments will be located here. The factory remains in Boston, but the erection of another factory in or near New York is planned.

Putting "Pep" into Advertising

There is a Big Difference Between "Advertising" and "Publicity"—Real Advertising is the Greatest Business-Building Force Yet Discovered — Keep Your Copy Newsy and Full of Interest to the Buying Public

SOMEBODY has said that trying to run a business without advertising like winking at a girl in the dark, you know what you are doing but nobody else does. There is a whole lot of truth in this statement. The man who invests his money in a stock of goods today and then waits for people to come in and buy them may eventually dispose of them. But if he lets the people in his vicinity know that he has got in his stock and tells them all about what he has to offer, there is absolutely no question that his goods will move and keep moving, just in proportion to the advertising he does. Advertisements that are full of "pep" and have a real message to the buying public are not only read with keen interest, but have a real value in attracting buyers. Nothing that has yet been discovered will bring more business than advertising.

Value of Advertising

Remember that there is a tremendous difference between "advertising" and "publicity." Advertising is the life-blood of modern business. It has enabled those who use its forces intelligently to build, and build, and keep on building, an ever-expanding business. The great buying public, and that includes practically everybody, is interested in your message if you have got something of real interest to tell them. People will always read a well-written, catchy ad., while they will almost invariably pass over an uninteresting ad. with a mere glance. Some business men succeed in keeping thousands of people constantly on the look-out for their advertisements and they do it by keeping them interested. The people want to see "what So and So is advertising to-day." Ads. of this kind are always worth studying. They are worked out along certain definite lines and they produce certain definite results, the most important of which is bringing a constant stream of business.

Look over the ads. reproduced in connection with this article carefully. There may be a number of points in them that you can adopt with profit in arranging your own copy. Make your advertising message as simple and direct as possible. Illustrations lend value to ads. in which some special line is offered, as people always like to see a picture of what is offered. If you are going to use electros get good clear cuts, as smudgy cuts detract from an advertisement.

A Big Difference

One of the greatest differences between "advertising" and "publicity" may be shown very simply. A great many business men had the idea that if they used a very small space in their local paper and used it only occasionally they were advertising. Everyone has seen and can see even yet little one-inch spaces inserted maybe once a month, maybe once every three months, something along this line, "John Smith, Plumber, 66 King Street." The writer has often asked these men about insertions of this kind, what results they got and what results they expected, and what they thought about advertising. Their replies bear a remarkable similarity. In general they will tell you that their idea is to keep their name before the public. Some of them will even tell you that all they put the notice in for was because they felt it their duty to help support the home paper. Many of them will tell you that their "advertising" has not produced any very startling results.

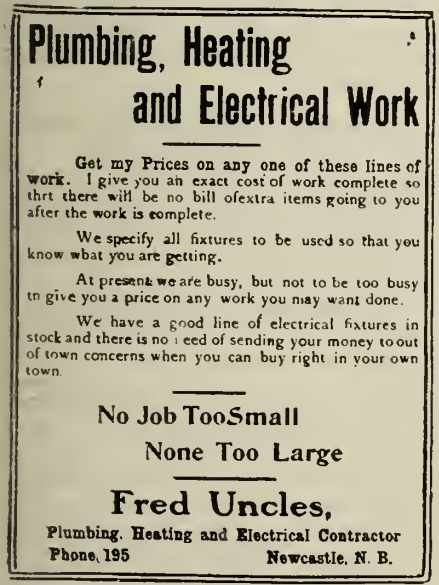
Have a Lot to Learn

These chaps have a whole lot to learn. To start with they haven't one idea of what real "advertising" is. They think because they buy space to the extent of $5 or $10 in a year that they are doing something. It is true that their effort, small as it is, is better than no publicity at all, but real "advertising" is as much bigger and better than the modern express train is ahead of the old-time stage coach. No man should expect to spend $5 or $10 a year for a bare announcement of his firm location, and business, and expect to build up a trade that will force him to erect a bigger shop. The men who have built up enormous businesses by advertising are the men who have used space and have used it conmoney, but they have taken in many times more than they paid out. These men did not try to move a Mogul engine with a toothpick.

Must Be Persistent

Advertising to be successful must be persistent. It is no use putting in an ad. two or three times a year. The firms that get results are those which keep their message constantly before the public. They never give people a chance to forget either the firm or what it has to offer and they make their messages so attractive that people look for them and are disappointed if they do not see them.

It takes time and care to look after "advertising," but the results are worth many times the efforts. Advertisements to "pull" must be varied. You may tell about the same line of merchandise each time, but you can inject into the ad. mat-


Plumbing, Heating and Electrical Work
Get my Prices on any one of these lines of work. I give you an exact cost of work complete so thrt there will be no bill ofextra items going to you after the work is complete.
We specify all fixtures to be used so that you know what you are getting.
At present we are busy, but not to be too busy to give you a price on any work you may want done.
We have a good line of electrical fixtures in stock and there is no need of sending your money to out of town concerns when you can buy right in your own town.
No Job Too Small
None Too Large
Fred Uncles,
Plumbing, Heating and Electrical Contractor
Phone, 195 Newcastle, N. B.

This is a good straight from the shoulder appeal, the kind of a talk that will interest every householder or others who have plumbing or electrical work to do and are looking for service and efficiency. An ad. of this kind should produce excellent results and establish confidence in the proprietor and his shop. The reproduction is half the size of the original ad.

How about a Bathroom in your House?
Why not let us instal a pumping outfit as illustrated here so that you will be saved the trouble of pumping water for the stock while you are busy in the field.
Haying will be here in a few weeks, hoeing and then harvest and to be relieved of the burden of pumping water will make it easier for you. Ask us to call and see what you require. We will be glad to do so.
Noble & Rich
SANITARY AND HEATING ENGINEERS.
Phone 538 London, Ont.

Going after business aggressively is one way of getting it. The ad. shown above is one used by Noble & Rich, of London, Ont., in papers in towns from 15 to 20 miles away. In this way they make a direct appeal to a rich farming territory, and secure a lot of out-of-town trade. The original ad. was twice as large as that shown above.

ter that will carry a wide appeal to the buying public in general.

How They Do It

There are different ways of doing this. Some firms adopt the plan of telling people about their goods, how they are made and what they will do and all about them. This is a very popular form of advertisement. Most people like to read about equipment and what it will do and how it is made and so on. Other firms adopt the plan of using attractive cuts, quoting prices and giving a short, snappy description. Ads. of this kind nearly always reach the people interested in buying at once and bring them to the store to ask for further information. Then it is up to the salesman to close the deal. Advertising of this kind has produced some splendid results. Another very effective method of producing sales is to feature some single line in each advertisement. For instance, bath tubs may be advertised. In this case an illustration of a handsome bath tub is shown. Along with it is an advertising talk about its value in the home, the service it will give, cost of installation and so on.

Like Illustrations

It is a good plan to use illustrations, but care should be taken to see that good cuts are secured. Everyone who is interested in the goods advertised likes to see a picture of what it is like. It is remarkable how people will carry in their minds pictures they have seen of goods advertised. It impresses them. If the price is given they almost invariably remember both the goods and the price. Any number of firms state that they have people come in from all parts of the country and ask for this or for that article which was advertised as such and such a price. If poor cuts are used the effect of a good ad. is spoiled, as the illustration is likely to turn out a mere blot instead of a sharp, clear representation of an article of merchandise.

A Big Advantage

One of the big advantages of advertising is in the wide territory that is covered, and covered thoroughly. Advertising works night and day. It never stops. Your ad. will be read by the man in the city or town, it will be read by the farmer's wife miles out in the country, and by buyers over a wide area. If the message is well written and newsy they will read it with interest. If it contains nothing but mere words the chances are they will merely glance at it and pass on to some ad. more interesting.

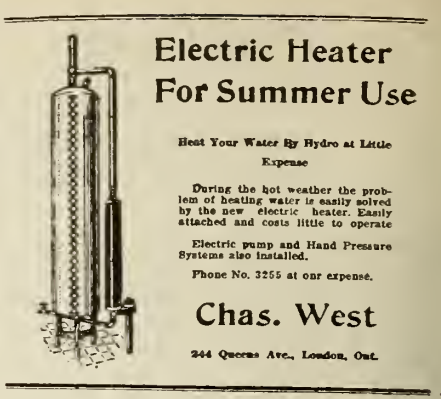
Sanitary and heating engineers who are located in towns and cities back of which are extensive farming communities should pay special attention to the messages they send out. The farmers are becoming big buyers of anything that will make their homes better. There is an enormous field in the farming districts for the sale of sanitary conveniences, bathroom equipment, water pumping plants and other lines. The farmers have the money to buy these things and they are buying them as never before and the dealer who stocks these goods and then lets the people know where they can get them is laying the foundation for some real business.

Pays to Be Aggressive

It always pays to be aggressive and never more so than in advertising. The buying public likes the merchant who shows that he is alive and has a real message for them. They will come to his shop and will talk about it to their friends, and come back again and again. This is why some of the firms who have not been afraid to advertise generously have reaped such rich rewards. These firms appreciate fully the value of having people look for their ads., of having them come to their stores regularly and of having them talk about the bathroom fixtures they bought from Jones, the electric iron they saw in his window or other things.

Do It Systematically

If you are going to advertise do it systematically. Set aside a definite amount of money each year for advertising and then see that your copy is changed regularly, and that each advertisement that goes in has something of interest. Remember that if you let the same ad. appear day after day, or week after week the effect on the buying public is somewhat the same as if you get apple sauce and bread and butter for breakfast, dinner and supper all through the week. Naturally you would lose interest in bread and butter and apple sauce, in fact, you would get sore at not having any change. The public is the same. You may tell them about the same things each time, but tell them in a different way.


Electric Heater
For Summer Use
Heat Your Water By Hydro at Little Expense
During the hot weather the problem of heating water is easily solved by the new electric heater. Easily attached and costs little to operate
Electric pump and Hand Pressure Systems also installed.
Phone No. 3255 at our expense.
Chas. West
244 Queens Ave., London, Ont.

This reproduction, which is half the size of the original, shows how Chas. West, of London, Ont., goes after out-of-town trade. The ad. was taken from an Exeter paper, Exeter, Ont., being thirty miles north of London. In the territory between many hundreds of farmers, who can easily obtain Hydro power, reside.

ADVERTISING AND A WOMAN

There was a man in our town
Who wasn't wondrous wise,
He thought that he could build up trade
And never advertise.

He never told his wife a thing
About his business, and,
Of course, as she was ignorant,
She couldn't lend a hand.

One evening when he came back home
His wife, a keen expert
In bargains, showed what she had bought
At prices cheap as dirt.

At once he saw that they were goods
From his competitor,
And with a gurgling cry of rage,
His voice arose for war.

"Now, John," she said in soothing tones,
When he had fired his shot,
"How should I know that these here goods
Were like what you have got?"

"I saw the advertisement in
The cars and thought that I
Could save you quite a little sum
On what I had to buy.

"And so I bought this lot of goods.
Like everybody buys,
With ordinary business sense,
From firms that advertise.

"If you had goods like these to sell,
You never told me so,
And as you kept it to yourself
How ever could I know?"

There is a man in our town,
Some wiser than he was.
But never do his ads. announce
His wife to be the cause.

—W. J. L., in *Fame.*

MORNING EXERCISES FOR THE TIRED BUSINESS MAN

Stand in the middle of room, raise arms slowly overhead, take deep breath and say "Damn the Government!" lowering arms in attitude of despair. Ten times.

Extend body flat downward on floor, cover eyes with hands, kick heels, think of the railroads and weep till dry.

Kneel, wring hands, meditate upon the labor unions and groan 150 times.

Assume sitting position, hands on hips, sway gently to and fro and concentrate on the Department of Trade and Commerce until a generous frothing at the mouth sets in. Till exhausted.

Collapse on floor. Grovel vigorously, think of the income tax and gnash teeth as in anger. Ad lib.

Note. — Observe this simple regimen every morning before breakfast and you will reach the office with most of the cares and troubles of the day already out of your system.—Adapted from Commerce and Finance.

Cartage Rates Are Increased

Three Big Railways Put New Schedule Into Effect on September 4th in Ontario and Quebec—Higher Wages for Employees and Shorter Working Hours Are Given as the Reason

ADVANCES in cartage rates in Ontario and Quebec which will affect a number of lines of hardware goods are announced by the three largest railways, the Canadian Pacific, Grand Trunk and Canadian National. The new rates will go into effect on September 4. Just what action the other railways will take is not yet known, but it is generally expected that they will also advance their cartage prices.

The railways give as their reason for revising the rates that the shorter hours demanded by employees and the higher wages they are now being paid make it imperative that cartage prices be increased unless business is to be carried on at a loss.

Affects Hardware

The hardware line on which advances will be made are as follows: conductor pipes, garden utensils, iron farm gates, woodenware, eavetroughing, stove pipes and elbows, lamp chimneys.

Advances which indirectly may affect hardware dealers are made in broom stock, and dry hides.

It is stated that even at the increased prices the cartage rates in Canada will be much lower than are in effect at American points.

As the cartage companies do not come under the jurisdiction of the Railway Board or any other bodies at Ottawa, no protests can be made by merchants or manufacturers. If they do not like to deal with the cartage companies they are at liberty to make any arrangements they wish for deliveries of goods.

The New Tariffs

The new tariffs provide for the following increases: On carload lots from 4½c per 100 pounds to 5c, and on less than carload lots from 6c to 7c per 100 pounds.

On "smalls," 300 pounds and under, the charge is raised from 25c to 30c per 100, and over 300 pounds from 35c to 40c, a straight increase of 5c per 100 pounds.

		Carloads	Less Carloads	SMALLS Minimum charge in cents for any one consignment	
		Cents per 100 lbs.		300 lbs. and under	Over 300 lbs.
Montreal	Que.				
Atwater	"				
Hochelaga	"	5	7	30	40
Mile End	"				
St. Henry	"				
Toronto	Ont.				
Don	"				
North Toronto	"	4	6	30	40
Parkdale	"				
West Toronto	"				
Guelph	Ont.				
Ottawa	"				
St. Hyacinthe	Que.	4	5	30	40
Three Rivers	"				
Bothwell	Ont.				
Chatham	"				
Glencoe	"				
St Thomas	"	3½	4	25	35
Thamesville	"				
Tilbury	"				
Hamilton	Ont.	3½	5	30	40
London	"	3½	4	30	40
Windsor	"	3½	5½	35	50

A cartage service is maintained at the points shown in the above table and cartage charges are to be collected in addition to the freight charges the railways state. These cartage charges will be based on the actual weight subject to the minimum provided in the Canadian Freight Classification.

The details are shown in the table of rates reproduced. The rates to Bothwell, Chatham, Glencoe, St. Thomas, Thamesville and Tilbury on all shipments, to Hamilton, London and Windsor in carloads, and to London in less than carloads are the only ones that do not show an advance.

The cartage charges shown in the table herewith will not apply on:

(1) Freight carried under Canadian Freight Classification classified lower than fifth class.

(2) Freight carried under other classifications which may classify therein 5th class or higher, but which is lower than 5th class in Canadian Freight Classification.

(3) Freight weighing 2,000 pounds or over, per piece or package.

(4) Freight in bulk, carloads, classifying 5th class or higher.

(5) Freight for private house delivery.

Acid in carboys or demijohns, agricultural implements, ash sifters, baby carriages, baskets, baths, boats, bone black (in bags) brooms (straight shipments), churns, cream separators, doors, windows, door and window sashes and frames, including skylights and ventilators, metal or wooden empty packages and containers, new or old, except when K D flat, whether loose, nested or jacketed, in crates or boxes or otherwise; excelsior, furnaces and parts thereof; furniture, sewing machines, including clothes lockers, metal or wooden; glass in packages exceeding five feet in height or length; joiner's work, loose lumber and ladders, lamp black in bags, loose leather, machines and machinery of all kinds, portable buildings, scrap paper and scrap rubber in bags or uncompressed bales, safes and vault doors, screen doors and window screens, stoves and parts thereof, trunks, globes, glass and electric bulbs; iron and steel products exceeding twenty-five feet in length; trunks, empty or full; vehicles, automobiles, bicycles, motorcycles and parts thereof, including tires; washing machines.

F. H. Scholey, recently with F. H. Lepper & Co., Calgary, and for several years with Cotter Bros., of Winnipeg, has accepted a position as traveler with Metals, Limited, of Calgary.

Prevent Communicable Diseases

Federal Minister of Health Should be a Cabinet Minister, Declares President Arthur Rigby at Annual Convention of the Western Canada Sanitary Inspectors' Association—Many Important Matters Were Discussed at Saskatoon Gathering

"PERSONALLY I am of the opinion that the Federal Minister of Health should be a cabinet minister. We have ministers of agriculture, marine, public works, and other departments. These touch only sections of the community. Public health affects every person in every community. If we can only get the public to see this I expect to see a division for the prevention of communicable disease."

This view, expressed at the sixth annual convention of the Western Canada Sanitary Inspectors' Association by President Arthur Rigby, of Winnipeg, was listened to with the keenest interest by delegates and civic officials from Ontario, Manitoba, Saskatchewan and Alberta. The meeting was held at Saskatoon and lasted for two days.

President's Remarks

"During the past year," continued President Rigby, "as a result of the efforts of the Saskatchewan members of the association, a most important clause was inserted in the Saskatchewan Public Health Act, defining the status of a sanitary inspector as one recognized by our association. The Union of Municipalities of Manitoba also passed a resolution recommending the appointment of qualified men. Our present membership is sixty-three and we have twenty-seven associates.

Only Promises So Far

Strong efforts were made to induce the Manitoba Provincial Board of Health to appoint sanitary inspectors, or at least to see that municipalities appointed only qualified men. This board, apparently, unlike other provincial boards, is not seized with the importance of this work, and has not done anything in spite of the repeated promises of consideration."

Mr. Rigby gave a brief outline of the progress made by the association since its inception in Regina in April, 1912. At that time a temporary constitution was drafted and officers chosen. He also spoke of the Great War, the work done by Canadian soldiers, and the work to be done in the period of reconstruction.

Spirit of Service

"So much for the past," continued President Rigby, "and now what is our object for the future? I have made reference to those members who paid the supreme sacrifice. I wonder if for the future we might not catch some of that spirit of service which these men so ably exemplified in life and death.

"An old Greek orator, speaking of their dead, after one of their numerous wars, said: 'These men gave their bodies for the commonwealth and received for his memory, praise that will never die. And with that the grandest of all sepulchres—not that in which their mortal bones are laid, but a home in the minds of men, where their glory shall remain fresh to stir speech or action as occasion may call.'"

Importance of Prevention

President Rigby thought that the members of the association were too modest, and that they should never lose on opportunity to impress on the powers that be, through their health officers, health committees, and the minister of the crown having the direction of public health affairs, the importance of the prevention of diseases; and that, while all honor should be given to the realm of curative medicine, it should be recognized that prevention may render a considerable part of that service unnecessary.

During the war 22 members of the association enlisted and five made the supreme sacrifice.

Urges Co-operation

At the afternoon session Dr. Arthur Wilson, Medical Officer of Health for Saskatoon, gave a splendid paper entitled, "A Vision of Public Health." He emphasized the extremely important results which would follow better co-operation between the health officials and ratepayers which he believed would redound to better conditions in every city and town.

In order that diseases and epidemics may be prevented, he asked that the local health officers get in close touch with the inhabitants of the town or city where they are employed, in order that the public in general will be better educated in the means which will prevent communicable diseases.

Home Comes First

An interesting discussion on housing conditions was led by E. W. J. Hague, Assistant Chief Sanitary Inspector of Winnipeg. In his discussion of the subject of housing, which is now occupying the attention of the Dominion, Provincial and local Governments, Mr. Hague stated that the home comes first, and if the homes are unclean no community will have good citizens.

"Society must teach the child to be cheerful, for if he grows up in an atmosphere of filth he cannot be expected to be a good member of society," said Mr. Hague. "In the past, houses were usually built to sell, not for the chief purpose of housing a family."

Must be Sanitary

Mr. Hague urged that some plan should be evolved whereby the municipality be empowered to construct houses which could be sold to the working man and that the houses be built on sanitary plans. He also insisted that before a newly-constructed house is allowed to be occupied that it be inspected by the health inspectors. In support of his contentions the speaker cited numerous authorities, the majority of whom had made a study of tenement conditions in the larger cities of the United States.

Working Men's Homes

Thomas Watson, delegate from Moose Jaw, urged that a movement be started the realization of which would enable the various municipalities to borrow money from the federal Government with which to erect homes for working men. He urged that the reason why money be handled by the municipalities was that it would prevent speculation. In order that the health of the Dominion may be kept better Mr. Watson said that no town sites should be allowed to be placed on ground which is low, regardless of whose material interests may be affected. He also emphasized the need of building lots which are of greater width than 25 feet.

See Filtration Plant

The second day of the convention opened by the delegates paying a visit of inspection to the city's filtration plant, through which the members were piloted by G. D. Archibald, C.E., city engineer. Later they went to the university and experimental farm and the public schools.

In the afternoon the delegates were taken for a practical demonstration of scientific house construction to the model "thermos" house in Nutana, which was thoroughly explained to them by Mr. H. Gauvin.

Two papers were read before the convention, "Garbage Disposal, Efficiency Combined with Economy," by S. E. Whiteside, A.R.San.I., Medicine Hat, Alta.; and "Sanitation at the Front," by R. M. Murray, sanitary engineer, provincial bureau of public health.

Tendered Banquet

The convention came to a close by a banquet in the Masonic Building, tendered to the visiting delegates by their Saskatoon fellows. President Rigby, of the association, proposed the opening toast, "The King," which was followed by a song rendered by Mr. Alexander

Continued on page 24

Saving Fuel in Heating a House

By L. P. BRECKENRIDGE and S. B. FLAGG

The total output of coal in the world during the calendar year 1913, according to a Government report,* was 1,443,393,052 short tons, and of this enormous amount 39.5 per cent., or 570,048,125 tons, was mined in the United States. Probably 10 to 15 per cent. of the coal produced in this country went to purchasers who used it largely for heating dwellings. The Federal Government uses a large quantity of coal for heating the many small buildings occupied by its various departments and bureaus, and is therefore directly interested not only in selecting proper fuels, but in obtaining the best possible results from their consumption. Because of this interest on its own account and the widespread interest of householders the Government some years ago conducted tests to determine the relative value, for use in residence-heating boilers, of several typical fuels.†

The value a householder gets from the fuel he burns depends largely on the character of the heating apparatus, the conditions under which it is installed, and the manner in which the fire is handled. The authors, from experience in firing residence-heating apparatus and from observing the methods employed by many who attend to such apparatus, keenly appreciate the importance of proper firing methods, and have written this paper in the belief that some general remarks on the selection, care and operation of residence-heating apparatus may prove of value to many who are interested in burning fuel in the most economical manner.

There is the first instalment of the fourth of the series of Engineering Bulletins issued by the United States Fuel Administration in collaboration with the Bureau of Mines, Department of the Interior. This series is receiving very favorable comment. In the next instalment on "Saving Fuel in Heating a House," "Factors Governing the Consumption of Fuel and Convenience of Operation" will be dealt with. This fourth article covers the saving of fuel in house heating thoroughly and should appeal to every heating engineer. There will be three instalments. Keep them all for reference. — EDITOR'S NOTE.

Fuels Used For Heating Residences

MOST people when fuel for residence heating is mentioned think of the particular kind that they are accustomed to use, but, of course, all people do not use the same fuel. Locality, climate, cost, and other considerations govern the choice, and the fuel used may be wood, anthracite, bituminous or subbituminous coal, lignite, peat, coke, oil, or gas. Even electricity may be used.

Wood

Wood is little use for heating residences except in those regions where it is plentiful and other fuels are relatively expensive. Some people in places where coal is the usual fuel burn wood in open grates because of the cheerful appearance of the fire, but the quantity of wood available for fuel is becoming less and less. Because of the relatively high percentage of water in wood—usually between 15 and 40 per cent.—the amount of heat obtainable by burning a pound of wood is relatively small.

Anthracite

Many people select anthracite for residence heating because it is clean, but additional reasons are its fairly high heat value, the relative ease with which a reasonable proportion of this heat value can be realized by heating apparatus, the easy control of the fire, and particularly the long period for which the fire may be left without attention. But anthracite is becoming more expensive and therefore its use is being restricted.

Bituminous Coals

The bituminous coals vary so much in composition and in physical characteristics that they can hardly be considered as one class. In general it may be said that the bituminous coals mined in the Eastern part of the United States are of higher rank than those produced farther west, having usually a greater heat value, less inert matter (or ash), less moisture, and a smaller proportion of gaseous constituents, or, as these are ordinarily termed, volatile matter. Bituminous coals also differ widely in coking properties; those mined in the Eastern States tend to coke or cake together when heated in the furnace, and with many of them the tendency is very decided, whereas coals of the same general class mined in some of the States farther west have little or no tendency to coke, and still other western coals have much the same coking properties as do the eastern coals. The bituminous coals constitute a large part of the fuel used throughout the country for heating purposes, for the reason that they are the most readily available and the cheapest fuel.

The different bituminous coals vary greatly in heat value, some of them ranging as high as 14,700 and others as low as 8,500 or 9,000 British thermal units per pound, a British thermal unit being the quantity of heat required to raise the temperature of 1 pound of water 1° F. Ordinarily, the heat value of a fuel is determined by burning a small quantity of the fuel inside a water-jacketed steel bomb containing oxygen gas under pressure. The heat generated by the burning of the fuel raises the temperature of the water surrounding the bomb and by knowing the quantity of fuel burned, the amount of water in which the bomb is immersed, and the rise in temperature of this water, it is possible to compute the number of heat units that 1 pound of the fuel will generate.

Subbituminous Coal, Lignite, Peat

Subbituminous coals, lignites, and peat are ordinarily used within comparatively short distances from where they are produced. Both the subbituminous coals and the lignites slack or break into small pieces on exposure to the air. This unfavorable feature and the further fact that neither of these fuels can be stored without danger from spontaneous combustion, as well as the usually low heat values, limit the area within which they can profitably be transported and used.

The peat bogs in the United States have not been largely utilized as sources of fuel, because of the abundance of fuels of higher grade. Most peat when dug from the bog contains 90 per cent. by weight of water, and the commercial processes of making peat fuel involve maceration of

*Parker, E. W., The production of coal in 1913; Mineral Resources U.S. for 1913, U.S. Geol. Survey, 1914, pt. 2, p. 783.

†For results of these tests see Randall, D. T., Tests of coal and briquets as fuel for house-heating boilers: Bull. 27, Bureau of Mines, 44 pp.

the wet peat, moulding into bricks, and drying by exposure to the air. Artificial drying in ovens or kilns is possible but is expensive. Because of the cost of preparing peat fuel and the abundance of other fuels in this country, it is probable that the use of peat for heating residences will not increase greatly in the near future.

Coke

The coke used in residence heating is obtained from three sources: (1) from retorts of coal-gas plants, as the residue after the gas has been driven from the coal; (2) from by-product coke plants, which are built to produce coke and to obtain gas and other by-products; and (3) from beehive ovens, which are built to produce coke only. In some places retort coke from coal-gas plants has long been used for residence heating, but until recently the quantity so used has been small. Beehive coke is not extensively used as a household fuel, but in some places the demand for it is considerable and its use is increasing. By-product coke ovens are increasing rapidly and household use of by-product coke is growing apace. Lack of information as to the proper methods of burning explains largely why coke has not been more generally used. Recently manufacturers and distributors of coke have done much to supply such information, and have emphasized the advantages of coke as a household fuel, the principal one being cleanliness.

Fuel Oil

The use of oil fuel for house heating, except in the small kerosene stoves employed by some people to supplement other means of heating, is confined almost entirely to those districts where oil is plentiful and the price of other fuel is relatively high. Oil-burning stoves are used with wickless ("blue flame") burners in which the fuel is vaporized after the stove has been given a preliminary warming. The distillate used in such stoves somewhat resembles ordinary kerosene but is slightly heavier. These stoves would hardly prove satisfactory for heating dwellings in localities where winters are severe, but they serve well in places where the climate is relatively mild and heat is required only at times and for a few hours at a time.

Gas

Gas is the ideal fuel. Within the last few years the use of gas stoves for cooking has not only become common, but in many cities is displacing stoves using other fuels. Lower prices for gas are largely responsible for this increase, but convenience and cleanliness are factors of possibly equal importance. The gradually increasing cost of anthracite is causing not a few people to consider gas as a fuel for residence heating and it is probable that the use of gas heating appliances will increase. In some localities natural gas is so cheap that its use is common and continues until the cost of transportation from distant fields makes the price of this fuel prohibitive.

Heating With Electricity

Electricity is little used as a principal means of heating dwellings, except in those localities where hydro-electric plants have been erected in connection with irrigation projects and the demand for current for power and lighting is still too small to make an economical load for the generation station, thus making advantageous the sale of current at a low rate for heating purposes. If, as sometimes happens, the cost of coal or other fuel for domestic heating is high in such localities, it may be possible to heat by electricity without great increase of expense and with a minimum of work and inconvenience. Under conditions other than those just mentioned, the cost of heating by electricity, except for short periods when a supplementary means is required, will probably for some time be high enough to prevent a large use of electric heaters. The reason for this is that in present methods of generating electric power in large stations the heat derivable from a certain amount of electric energy is only a small part—between 7 and 20 per cent., according to conditions—of the heat represented by the solid or liquid fuel required to drive the generators. In other words, the conversion of fuel energy into electrical energy involves such large losses that most people for some time to come will not use electricity for warming dwellings.

Advantages and Disadvantages of the Different Fuels

Some of the advantages and disadvantages of different fuels for residence heating have been mentioned. These and some others that have not been stated are summarized in the following table:

Advantages and Disadvantages of Various Fuels and of Electricity..

Fuel.	Advantages.	Disadvantages.
Wood	(a) Cleanliness, (b) cheerful fire, (c) quick increase of heat, (d) cheap in some localities.	(a) Low fuel value, (b) large storage space necessary, (c) labor [illegible], (d) scarcity, (e) does not hold fire long, (f) unsteady heat.
Anthracite	(a) Cleanliness, (b) easy control of fire, (c) easier to realize heat in coal than is the case with other coals, (d) steady heat.	(a) High price, (b) difficulty of obtaining, (c) slower response to change of drafts.
Bituminous coal	(a) Low price, (b) availability, (c) high heat value (in the best grades), (d) low percentage of inert matter (in the best grades).	(a) Dirty, (b) smoke produced, (c) more attention to fire and furnace necessary than with anthracite.
Subbituminous coal and lignite	(a) Relatively low price, (b) availability (in some regions), (c) responds quickly to opening of drafts.	(a) Slakes and deteriorates on exposure to air, (b) takes fire spontaneously in piles, (c) heat value generally low, (d) heat in fuel difficult to realize, (e) fires do not keep well, (f) gases generated over fire pot sometimes burn in smoke pipe, causing excessive heating.
Peat	(a) In general, the same as for wood	(a) Low heat value, (b) bulkiness.
Coke	(a) Cleanliness, (b) responds quickly to opening of drafts, (c) fairly high heat value.	(a) Bulkiness, (b) liability of fire going out if not properly handled, (c) fire requires rather frequent attention unless fire pot is deep.
Oil	(a) High heat value, (b) immediate increase of heat, (c) cleanliness, (d) small storage space necessary.	(a) High price, (b) difficulty of safe storage.
Gas	(a) Ease of control, (b) cleanliness, (c) convenience, (d) immediate increase of heat.	(a) High price in many places.
Electricity	(a) Every advantage ...	(a) High price.

Methods of Heating Residences

Fireplanes

The first fuel and for centuries the chief one used in residence heating was wood. Heating and cooking operations were often combined and the old open fireplace with its immense chimney served for both purposes, although in spite of some obvious advantages it was not adapted to produce economically and efficiently the heat needed for either. The need of improved devices was probably more keenly felt in cooking than in heating, and the use of stoves for cooking became quite common while the open fireplace, in a modified form, was still employed to heat the house.

In any open fireplace, however, close control of the combustion of the fuel is difficult; and large volumes of air not necessary for combustion are, after being heated, carried up the chimney and must be replaced by cold air from outside, which must be heated in turn. One of the most important considerations in economically utilizing any fuel is proper regulation of the volume of air supplied

the fire. A familiar illustration of this fact is afforded by the mantle burner for gas lighting. In the best makes of these burners there is provision for controlling the supply of both gas and air, the most intense heat, and consequently the best light, being obtained when the supply of both air and gas is properly adjusted.

Stoves

Stoves with dampers in the smoke pipe and with draft slides in the fire and ash-pan doors afforded some regulation of the air supply and in addition served to confine and ocnserve the heat generated so that it could be more effectively utilized. Stoves were developed for burning not only wood but also coal, oil, and gas, although the invention and perfection of more desirable types of heating apparatus served to check the improvement of stoves in this country. In the United States, owing to the comparative abundance and cheapness of fuel, the demand in residence heating has been not only for a high temperature standard but also for greater convenience of operation and perfection of control. In foreign countries much less use is made of what in this country are considered the best methods and equipment for residence heating, but, on the other hand, stoves have been more highly developed there. Some foreign stoves burning what is considered in this country much poorer fuel offer almost the same perfection of control and ease of operation as the anthracite "base burners" or self-feeders," formerly so popular.

Hot Air, Steam, Hot Water

The next step toward greater convenience in heating residences was the substitution of one fire in the cellar or basement for separate fires in each room. To convey the heat from the point of generation to the rooms, three general systems have been developed—air, steam, and water heating.

Hot-air Heating

The simplest apparatus for heating a house, as well as the cheapest in first cost, is the hot-air heating system. The air to be circulated, taken through a duct from the outside of the building or from the lower part of the house, passes through the air passages of the furnace, which are heated by the fire or the hot gases from it, and then is distributed through pipes and registers to the rooms to be heated. The air in the circulating pipes is expanded by heating and becomes lighter than the air that enters the furnace passages or the air in the rooms, so that when the registers are open and the furnace is in operation a stream of heated air enters each room.

As the warm expanded air leaving a register can hold much more moisture than the cooler denser air that entered the heating passages of the furnace, it has a drying effect and may cause cracking of furniture and woodwork in the rooms heated. To reduce the dryness of the air, moisture may be added to it by evaporating water in the hot-air passages of the furnace or in other ways.

Difficulty may also be experienced in heating an exposed dwelling by hot air on a cold, windy day. As the rooms are warmed by the movement of heated air, that is, by the convection of heat, there is more tendency for the windward side of a house to be cold and the leeward side to be warm than when the rooms are warmed, at least partly, by direct radiation from steam or hot-water radiators. Limitation of trouble from this cause will largely depend on how well the house is built.

Steam and Hot-water Heating

When steam or hot-water heating is to be used radiators are placed in the different rooms, usually near the windows, and these are connected with the steam or hot-water boiler in the basement by means of suitable piping. Steam radiators may be smaller than hot-water radiators and yet give off more heat, because the temperature of the steam radiators usually will exceed 212° F., the exact amount depending on the steam pressure in the radiator, whereas hot-water radiators will usually have a temperature between 90° and 180° F.

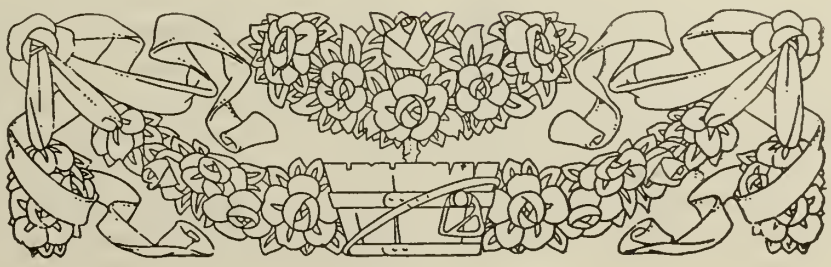
For warming a given space, the first cost of a hot-air system of heating will be less than that of either hot water or steam, largely because of the cost of the radiators, and the initial outlay for steam heating will be less than for hot water. The relative costs of operation, however, are apt to be in the reverse order, although the differences in operating costs will be problematic.

One of the desirable features of a hot-water heating system is the possible range in temperature of the water, enabling the heat to be varied according to needs. Such variation is not possible if the house is heated by the usual low-pressure steam system, neither can the output of a steam radiator be reduced by partly closing the valve, as is possible with a hot-water system, unless the piping and fixtures are rather elaborate. On the other hand, a steam heating system can respond to sudden demands for heat much more quickly and the radiators required are somewhat smaller.

Factors Affecting Design of Heating Apparatus

In the development of new types of heating devices or in the improvement of existing types, the chief factors influencing design are two. The first is maintenance of more satisfactory temperature conditions with the same or less inconvenience of operation, manufacturers of heating appliances endeavoring to produce heaters that will go for longer periods without attention, or can be given necessary attention with a minimum number of trips to the basement. The second factor is the desire to utilize more effectively the available heat in the fuel. Owing to the abundance and relative cheapness of fuel in this country, the incentive to efficient utilization has not been strong, but as the cost of fuel and of other necessaries increases, economy and efficiency will receive more and more attention. Inasmuch as the design of the apparatus is only one of the elements that determine the annual fuel bill, the factors that govern consumption of fuel and convenience of operation are considered here.

Continued in next issue.



EDITORIAL COMMENT

MORE BATH TUBS NEEDED

A HOUSING survey made in one block in the crowded section of New York by the State Reconstruction Commission recently showed that there was only one bath tub in forty-three tenement houses in which 1,700 people were living. This is a state of affairs which calls for action and the sanitary engineers ought to line right up behind the civic authorities and see that something is done. Conditions such as this cannot make for clean living and without clean living good health is impossible. Nothing is given out regarding the sanitary arrangements which existed in this area. They were probably so much better than the bathing facilities that no comment was necessary. It is a fact, however, that in a great number of homes, far more than the average individual would believe, there are no adequate sanitary conveniences and no bathrooms. This is bad enough in any place but in the big cities, where people live so crowded and where there are so many small children, the results are seen unmistakably in the high death rates. There is a big opportunity for the newly-formed Health Department at Ottawa and the local Boards of Health and the municipal councils to co-operate and enact legislation that will minimize the dangers resulting from lack of proper and necessary conveniences in every home. Nothing is of more importance to a country than the national health, or to a community than the health of the individuals comprising it. No reasonable precautions to safeguard public health should be neglected and when the small cost of installation compared with the years of comfort and service that sanitary installations give is considered, there is not the slightest excuse for any home being without proper equipment. There are unfortunately in every community certain tight-fisted individuals who will buck every move to make things better because it costs a little money. The only way to deal with these people is by having by-laws passed and then enforcing the by-laws. Case after case where tenants are suffering because landlords will not provide accommodations have been reported in Canada. Sooner or later every home should have the sanitary conveniences required and it should be one of the first duties of the authorities to see that this is looked after.

CIVIC DILLY DALLYING

ALTHOUGH the Board of Health at London, Ont., some weeks ago recommended to the City Council the appointment of James Young as city inspector nothing has been done except that the Council referred the matter back to the Board. Now the Trades and Labor Council are taking the matter up and state that they are opposed to delaying the appointment any longer. In some quarters, it is believed that the action of the Council has been taken with a view of delaying the matter and if possible having it laid over this year and sent on to next year's council. Mayor Somerville questions where the money is to be secured for paying the plumbing inspector's salary.

This is another example of the manner in which civic authorities trifle with public health matters. The Board of Health has made a recommendation and the Board of Health is supposed to know its business. If there is a serious outbreak of disease the Board of Health will get the blame. One of the most important safeguards of public health is proper plumbing, especially sanitary equipment. If the city of London is like many other Canadian municipalities where there is no plumbing inspector, conditions are likely to prevail that would shock many people if they knew such conditions existed. The idea of quibbling over the inspector's salary, a couple of thousand dollars a year at the outside, strikes one as rather penny wise and pound foolish, especially when an epidemic might easily result that would cause many deaths and put the city to thousands of dollars of expense.

KEEP AN EYE ON THE FARMERS

ALL over Canada farmers in thousands are busy saving a bountiful harvest that will bring to them many millions of dollars. The farmer has always been a big buyer, but under present conditions, with an unlimited demand at high prices for everything he can raise, he has literally money to burn. Thousands and thousands of dollars will be expended in house and barn improvements, in installing water systems, in buying new and improved equipment, installing bathrooms and sanitary equipment, new modern heating systems, and labor-saving

electrical devices. One thing the dealer must always keep in mind and that is that the farmer has got the money. He can afford the best and if the goods are shown to him and explained to him and it is made clear why a water system is going to make things better, or how an electric vacuum cleaner will save his wife time and drudgery he will buy. The farmer, in the next few months, is going to be the biggest buyer in the whole Dominion, and there are endless opportunities for the live plumbing and heating contractor to render him real service and sell a lot of goods. The man who gets the trade will not be the chap who sits down and waits for it to come to him, but who gets busy and interests the farmer in what he has to offer. On another page of this issue of SANITARY ENGINEER it is shown how some firms are reaching out after business through the medium of attractive advertising. This is one way of quickly and effectively reaching a wide territory. Another way is to have an attractive shop and window display. A manufacturer recently stated to SANITARY ENGINEER that there is big business for the man even in the smallest country town who systematically checks up the homes in his district that need equipment and then proceeds to sell it to them. He declares that the owners of the houses without modern equipment will welcome the dealer and buy from him provided he shows them that he has the real goods to offer and knows how to sell.

THE PASSING OF ANDREW CARNEGIE

IN the death of Andrew Carnegie, the world loses a figure that has been of outstanding interest for many years. He will be remembered in the years to come not so much because of his connection with the steel business, nor because he made a fortune that runs into the hundreds of millions but because of his work for young men. In his youth Mr. Carnegie was so poor that he was deprived of the advantages of good reading, and one of the first things he did upon gaining great wealth was to lay plans by which everyone who desired could improve themselves by reading. His gifts in the shape of libraries were not confined to the United States. There are many of them in Canada and in other countries. Just how many millions he gave for this work is not known but it was his earnest desire that all young men should have the opportunities for good reading that he longed for so earnestly when he was a youth and was denied. Mr. Carnegie also gave large sums for the establishment of parks and he was always a generous supporter of educational projects. It is estimated that he gave away in various projects $350,000,000. Just how much he was worth is not known but when he sold out to the Steel Corporation he received $500,000,000 in bonds. Mr. Carnegie laid his success to the fact that he was able to pick men more clever than himself to work for him and he frequently declared that if it came to a choice of losing his money or his partners he would rather lose the money. To young men his advice always was: "Start poor, lean on nobody, assume responsibility and always be ambitious."

A SCOOP

A CONTEMPORARY in an "outburst" caused by SANITARY ENGINEER scooping the Montreal Convention to the extent of publishing the report two weeks in advance of our contemporary, refers to our report as the hash which preceded the meat. It has been our experience that the real meat is generally served first, and the hash is made-up from the left-overs, which after a process of grinding, along with a mixture of other ingredients, is made into hash. The hash is generally palatable, but most of our readers prefer the fresh meat and that is why we publish the news while it is fresh, rather than canning it in cold storage for a couple of weeks before serving. The letters from the president, and immediate past president of the Dominion Association, published in last issue, are self-explanatory, and make it quite obvious that SANITARY ENGINEER'S prompt and extensive report was greatly appreciated by the trade. The report was secured and written by our own representatives, two of whom were in attendance at the Montreal Convention.

Says Association Price Prevails

Plumbers Are Told This Every Day When Asking for Quotations, Says Thomas J. Minnes, of Brantford, President of the Ontario Society of Domestic Sanitary and Heating Engineers in Discussing Dr. McFa ll's Charges

WHILE nothing further has been heard from Ottawa yet regarding the charges made by Dr. McFall, the Cost of Living Commissioner, the matter continues to arouse much interest in the trade. Many of the sanitary and heating engineers as stated in the last issue of SANITARY ENGINEER would welcome a probe into the situation in order to clear the air. As matters stand at present the men in the trade are suffering a good deal from what has appeared in the daily press, editorially and otherwise. This is to a great extent due to the fact that the general public fails to differentiate between the man who does the installing, the jobber, and the manufacturer. To the great mass of people they are all one, and the sanitary and heating contractors feel that they are suffering for the sins of someone else. Many of them state that they will gladly lend whatever aid they can in clearing the matter up and that as far as they are concerned their books are open for inspection at any time.

Is the Matter Dead?

Some of the manufacturers express the view that the whole thing will be dropped and that nothing more will be heard of it. Just what this opinion is based on is not stated.

Thomas J. Minnes of Brantford, Ont., president of the Ontario Society of Domestic Sanitary and Heating Engineers, writes to SANITARY ENGINEER as follows regarding the charges of Dr. McFall:

"Yours to hand asking for my views regarding Dr. McFall's newspaper accusation of manufacturers and jobbers of plumbing materials being in combine.

Association Price

"It is rather a strange request to be made of a master plumber, there being no connection between our class and the man higher up. It would, therefore, be quite unbecoming of me to attempt the offering of an alibi on their behalf, and in event of attempting the same, am sure the said attempt would fall down miserably when one is told every day, upon asking for a quotation on plumbing ware, that the association price prevails.

"Ask any drummer in the line, consult the manufacturers' or jobbers' net prices or discounts on anything from a sink bibb to a bath tub, or from an air vent to a 48 in. sectional steam boiler. Any man who can read can make this accusation as easily as Dr. McFall.

Is Behind Times

"I am afraid the Doctor is many years behind the times. Possibly the Doctor has needed some plumbing goods and sought to buy them direct, and upon being quoted the same price from a half dozen or so jobbers, thought he "smelt the rat."

"Be it understood that I have no other motive or reason in answering your letter than that it may reach the eyes of some of the retail and contracting plumbers, who have been passing the buck for the man higher up for some time, and that he may wise up to the part he has been playing in helping those in question to fatten their batting averages at the expense of the public, without a fair return for the part he has taken.

THOMAS J. MINNES

Of Brantford, Ont., President of the Ontario Society of Domestic Sanitary and Heating Engineers. Read what he says about the charges made by Dr. McFall.

How Do They Do It?

"My greatest fear is that, in event of Dr. McFall making an investigation he may carry it on to the contracting plumber and, finding the shortage of any profits, would demand by what means he obtained a livelihood. It seems to me there are many in the trade who would have a time of it trying to prove an alibi of any suspicion that might be created. However, there is one consoling fact in that the plumbing manufacturers and jobbers are not alone in the envious position which they hold, for it is conceded by most everyone that Canada is in the grip of the greatest combines ever known, no other country excepted.

Causes Unrest

"Figure out any article you wish to purchase by getting the American price, plus duty and war tax, and you have the prevailing Canadian market price, irrespective of cost plus profit. When we see and know the prevailing circumstances, is it any wonder that we have such a tremendous degree of dissatisfaction and unrest?

Gets No Profit

"The one thing that is beyond my comprehension is the way the contracting plumber keeps mum and tries to beat the game with the high cost of materials on the one side, and the high wages on the other side, merely passing the buck on to the public without a legitimate profit to himself.

"If any plumber would take time to think and figure for himself, he would soon see the role he is playing—selling goods for those who protect themselves and worrying about paying his men from $30.80 to $35.20 for 44 hours' work, while he is working many more hours, so that if it were figured at the same rate he would be surprised to find that he was not even making the union scale of wages out of his so-called profits.

"How much longer is he going to pass the buck?

"Yours truly,
"T. J. Minnes."

PREVENT COMMUNICABLE DISEASES

Continued from page 18

Duguid. The toast "Canada" was proposed by E. W. J. Hague, of Winnipeg, and replied to by Alderman Howard McConnell, of Saskatoon, who represented the city government throughout the convention. Mr. Alan Hancock gave two recitations during the banquet.

"Our association" was proposed by Mr. Cartledge, of Moose Jaw, and replied to by Thomas Watson, provincial sanitary inspector for Saskatchewan. The toast was followed by another song by Mr.Duguid. W. E. Stanley, Fort William, proposed "The City of Saskatoon," to which toast W. H. Appleton, of Saskatoon, made a fitting response. The last toast of the evening was "Absent Members," proposed by A. M. S. Allan, of Regina.

Short was the passage through this vale of care,
By concrete roads that autos used to wend;
But now we travel by the route of air—
A dead engine! we reach the journey's end!

Good Profits in Electrical Fixtures

Brisk Demand For These Goods as Result of Building Boom—Many Sanitary Engineers Taking Advantage of Opportunities Offered—Carrying the Stock to Show Home Builders Good Method of Clinching Sales.

THE splendid revival in building that is now in progress all over Canada opens up opportunities for selling electrical fixtures that many sanitary engineers are cashing in on. Every week sees a big jump in the building permits and it is very significant from the point of view of the man who handles fixtures that a very large percentage of the construction work now under way is for homes of a better class, that is, homes in which there is an opportunity to sell electric fixtures. As has been shown in recent issues of SANITARY ENGINEER, many of the sanitary engineers have been going after this business, and going after it most successfully.

Successful Methods

A case in a Western Ontario town is typical of what is happening in other places. In this town there were two firms handling electrical fixtures, one a regular electrical dealer and the other the sanitary engineer. Owing to conditions in the past four years building has not been brisk and neither wished to put in a very extensive stock. After sizing up the situation carefully this Spring and getting a line of what building was likely to proceed, the sanitary engineer decided to get ready for a greatly increased business. He not only put in a stock of fixtures which was calculated to meet the requirements of his town, but he put them right up in front of his shop and had them connected so that when people who were building homes came in he could show them exactly how the goods would look when installed.

Getting the Business

The stock of fixtures makes a fine showing in the store in connection with the other goods and at night when they are turned on the display is especially effective.

The electrical dealer, who is the only rival of the sanitary engineer, outside of the mail order houses, decided that instead of carrying a stock he would sell from the manufacturers' catalogues. The electric man and the sanitary engineer had practically equal opportunities as far as getting after the business at first went. They both knew most of the parties who were building, and from a sales point it simmered down to a question of whether the goods could be sold from the catalogue or from the stock in the plumbing shop.

The Lion's Share

Up to the present time the sanitary engineer has been getting away with the lion's share of the business and he attributes his success to the fact that he not only had the stock to show people when they called, but that he let them know he had it, by doing some advertising. He has had to meet some competition from the mail order houses, but has had no difficulty in more than holding his own every time. In this he was helped by the fact that one builder who ordered from a mail order catalogue got goods that were not at all like those he thought he was going to get. This man was not classified and he did not fail to let other people who were building know that the mail order firm goods were not what he had expected.

Sees Good Business

There is a lot of good business to be had all over the country in handling fixtures. One important consideration for sanitary engineers to keep in mind is not to stock up with goods that are either too expensive or too cheap for the people to whom they expect to sell. It is necessary to study this situation carefully and find out all about the class of houses that are being built.

A manufacturer stated to SANITARY ENGINEER that a mistake some dealers make is in not carrying sufficient stock to completely supply a prospective customer.

"Many of those who are building," he said, "want to have the same kind of fixtures in every room in the house. Some dealers have lost business by not being able to fill orders of this kind."

Outlook is Good

While it is difficult to forecast the extent of the building that will go on, those who have obtained from architects and contractors views as to prospects, state that the outlook is good. There is no question about the scarcity of dwelling houses in Canada. This shortage is general from coast to coast. The building that is already under way will not begin to meet the needs. The building program which got under way in the Spring has been developing steadily and there is every indication that it will continue to expand all the rest of the year and go on an even more extensive scale next Spring. Architects are very busy. Many of them have handled more work in the past eight or ten weeks than they have had to look after in five years.

Prices Not High

While prices of building materials have advanced the increase is not even proportionate to advances that have been made in other lines. As far as electrical fixtures are concerned there is little doubt that advances will be made shortly. Copper and brass have gone up and with all-round increases in wages the manufacturers say there is only one thing for them to do.

In Toronto the employees of one firm have been on strike for some weeks, having gone out with the metal workers. When the strike began this firm had on hand a large stock of electrical fixtures. Business has been so good that the stock at the present time is nearly depleted in many lines, and orders are being received constantly from all over the country.

Buying Good Goods

The opinion seems general in the trade that while there is not an extensive demand for really high priced fixtures there is a steady demand for medium priced goods of good quality. It is important to consider this when arranging to purchase a stock. The average person does not aim to buy some new electric fixture every day, and if the dealer can show him something of attractive design and good quality at a medium price there is little difficulty in completing the sale.

ELECTRICAL DEVELOPMENT ON FARMS NOTED

A significant feature of Western Canadian development that promises well for future electrical business is that farmers who are building new homes in the older and more populated sections are invariably having their houses wired for electrical lighting. This was the statement of Mellett & Co., Wetaskiwin; of the Red Deer Plumbing Company; of Allen Pettifer, Olds, Alta., and in fact of practically all plumbing and electrical experts met with during a trip embracing the greater part of the prairie country.

The lighting of farm homes by electricity has reached the point in Western Canada where it is desired by most good farmers. They have seen the various styles of lighting plants in operation in the homes of their neighbors and have become educated to the idea. Particularly are they impressed with the labor-saving results of using electric power for pressure systems, and for operating the various form of machinery used on the farm.

This year the farmers are not purchasing to the same extent as last season, owing to crop conditions that are not up to expectations, but a very extensive business is certain for the future.

Meeting To-day's Competition

Specialty Store the Store of the Future—With What Are You Competing?—Buy in Cold Blood, Sell With Enthusiasm—Limit the Lines But Give the Assortment

THIS is the fourth and concluding address delivered by Frank Stockdale, the noted business expert, in connection with the Saskatchewan R.M.A. Convention, as reported by the special representative of SANITARY ENGINEER.

The series of lectures has been followed with great interest and the points brought out in this lecture on "Meeting To-day's Competition" are worth careful perusal. Mr. Stockdale says that whereas to-day in the West, competition is probably from the general store, the store of the future is the specialty store. He indicates that the retail merchant's creed should be "Buy in Cold Blood and Sell With Enthusiasm." There is something in it too—think it over.

"WHEN we start to define competition we want to know what kind of competition it is," said Mr. Stockdale, opening his address on the subject, and proceeding to outline competition under the following headings: 1. General stores; 2. Specialty stores; 3. Department stores; 4. Mail-order stores; 5. Chain stores.

"A great evolution is taking place in business," continued Mr. Stockdale. "Western Canada is a developing country and that makes a difference. One of the things in a new country is the rapid change which takes place when the country begins to get settled. Then you have not only changes in retail merchandising but the changes that take place between a new and an old community. The question in the average man's mind is which of the foregoing classes of store is the store of the future? This is not a very important question. Don't worry about someone else's kind of a store, it is the way you take care of the kind of a store you are running. As the country grows older there will be fewer general stores. There will be more specialty stores, and general stores will evolve into department stores.

Specialty Store the Store of the Future

"In the West your competition is probably the general store, and you will have to face it. The store of the future is the specialty store. Department stores are collections of specialty stores, and in many cases in the United States the advertisements of the various departments of the department store are run individually in the newspapers as if to advertise individual stores specializing on the lines advertised.

"We have general stores competing with general stores, chain stores competing with chain stores, etc., and all competing with each other.

"My experience is that there is ten times as much noise over a customer who goes to the mail-order house as there is over a customer who goes anywhere else out of your town. I know the seriousness of mail-order competition in some districts, but you have a way of measuring this competition, whereas you have no way of finding out the amount of goods brought into your community in the suit cases of your townspeople when they return from the cities. We must realize that we are going to beat the field, and whoever is in the lead we are going to beat them. The flypaper stage of business is passed. By this is meant the time when customers used to light and stick. Many business men made their money at that time in new districts. The mail-order house has been a big factor in eliminating the flypaper stage of business. People are not forced to buy at one place. People are travelling. Your competition to-day is nation-wide. You are not competing just with the fellow across the street or in the next town, you are competing with the best they have in Canada, and when you talk of the best in Canada you are talking about the best in the world as far as retail merchants are concerned. The big octopus you talk about is one of the best managed businesses I have seen.

With What are You Competing

"What are you competing with? Low prices, beautiful stores, high class salesmanship, or what? I think you are competing with a man or men who have the keenest and highest developed brains along the line of retail distribution that are to be found anywhere. Your customers are reading their literature each evening. Your customers are going into their stores every day and are being served by stores managed by the keenest brains in business. And the only reason that you are able to exist is because of your advantage of being on the ground. If you had to compete side by side you would not stand very much show until you revised your methods of business. We are getting along in a way without any retail preparation. One retailer who made money yesterday figures he is going to make it the same way to-morrow, but he has to find another way to make his money to-morrow. You made your money in competition with certain kinds of merchants, now your competition is becoming nation-wide and the only way to meet it is to study merchandising yourselves.

"The retail store is one of the biggest business propositions to-day. The great trouble with many retailers is that they think they know the game. There is nothing more fatal than this. Business requires more kinds of the higher grades of ability than anything else. I have sympathy for you when I think of the pitfalls along your path.

"A good retail merchant must be a good buyer and a good seller. A manager of things and a manager of people. Selling is divided into three sections: 1. Display; 2. Advertising; 3. Personal selling.

Buy in Cold Blood and Sell With Enthusiasm

"One of the reasons why we are having business done in bigger units is because we cannot find a man who can do all of these things well. This is the reason for the general stores, department stores, etc., because we have to get specialists to do this job. Very few of us are good buyers and good sellers. The retail merchants' creed should be: 'Buy in cold blood and sell with enthusiasm.'"

At this point Mr. Stockdale gave an illustration regarding buying and selling. An Ottawa, Ont., merchant who now manages one of the biggest stores in that city, and who a few years ago travelled the city with sample rugs on his back, made the following statement: "I never allow myself to become enthusiastic over goods that I do not own, but once I own them they become the greatest goods that were ever brought to Ottawa."

"Two-thirds of the merchants to-day buy with enthusiasm and sell in cold blood," continued Mr. Stockdale, "and the stocks of goods in their stores proves this is true. Why does a man buy with enthusiasm? Because there are men who make their living by supplying enthusiasm to a man when he is buying. Hotels and trains are full of them. A man could not get far as a travelling salesman unless he can impart this enthusiasm.

Limit the Lines But Give the Assortment

"One of the reasons that people trade with mail-order houses and go to the larger towns is not price, but assortment. Where you have lines criss-crossing you have a partial assortment—a little of everything but not much of anything. You should not carry too many lines and be unable to give what may be required in any one of them.

"As long as you depend upon the salesman telling you what to buy, as long as you refuse to keep stock record systems you are going to buy with enthusiasm and sell in cold blood, because you will be dissatisfied after you get them. The only way to have enthusiasm which you can cash in on is to generate it yourself. Any man who generates en-

thusiasm gets paid for it."

The following definition for efficiency was hereupon given by Mr. Stockdale as follows: "Efficiency consists in buying from a Hebrew and selling to a Scotchman."

"We have got to find some way to give time and attention to our businesses so that we can do some thinking. Our competitors are winning out because they have more mental ability.

"In meeting to-day's competition you have to meet men who know how to figure profits, manage things, and manage people.

Some Questions Answered

In the discussion that followed some interesting questions were raised.

Question.—"In taking goods from stock for expenses of the store, should they be charged at cost or selling price, and why?"

Answer.—"There are two expenses in selling. One is carrying expense and the other is selling expense. A moderate overhead charge should be added on to the cost of goods in stock. When you deal with figures, deal with facts.

Question.—"Should there not be a distinction made in regard to cash and credit customers in the matter of the price charged for goods?"

Answer.—"A distinction is being made between cash and credit customers. The cash-and-carry stores and the mail-order houses are two examples. The general practice is to put the goods high enough so you can charge high enough and yet give discount to cash customers. By doing this you are not adding anything to anybody—so that they can see it."

At the conclusion of this address Mr. Stockdale spoke a few words, impressing upon the assembled retailers the necessity of getting away from their businesses to avoid getting in a rut and becoming narrow-minded.

"Come to conventions, and don't come thinking that you are needed at home. If this is the way you feel, it is because you leave no organization behind you," said Mr. Stockdale. "I admire the man who has the ability to take a vacation. I make this recommendation for two reasons. One is because of the things you will have to do in your store before you can take a holiday. The store has to be in running order and needs organization. The men who come to conventions usually have good businesses. The successful business man is the one who works for his community. He gets a perspective and sees what the other fellows are doing."

Joint Freight Tariffs to be Lower

Important Ruling of the Board of Railway Commissioners Will Result in a Considerable Saving to Many Shippers

An important ruling which will have the result of lowering joint class freight tariffs and will apply on interline traffic between the Grand Trunk, Canadian Pacific and Canadian National Railways will go into effect about October 1, according to an announcement made by the Board of Railway Commissioners for Canada.

Approximately the order means that in future, where shipments have to be made over two lines, they will be carried for what would be the cost on one, the mileage being taken as the basis. This, it is stated, will result in a considerable saving annually to many shippers.

Upon reading the submissions filed on behalf of the said railway companies, the Canadian Manufacturers' Association, the Boards of Trade of Toronto and Montreal, Dominion Canners, Ltd., and others, and upon the report and recommendation of the Chief Traffic Officer of the Board, it is ordered:

1. That within the territory covered by the order of the Board No. 3258, dated July 6th, 1907, as amended, in what is known as the International Rates Case, and in conformity with the relevant provisions thereof, also with the station groupings of the respective companies as shown in their tariffs between points west of Toronto on the one hand and points east of Toronto on the other, joint tariffs of class rates be compiled to apply between stations on the Canadian Pacific and Grand Trunk Railways, the Canadian Pacific and Canadian National Railways, and the Grand Trunk and Canadian National Railways, respectively, on the basis of the so-called schedule "A" scale, with the addition of the following figures to be incorporated in the rates themselves:

Class	1	2	3	4	5	6	7	8	9	10
Cents per 100 lbs..	8	7	6	4	2½	2½	2½	2½	2½	2½

the rates so compiled to include the service of transfer from the one company to the other; subject, however, to a minimum joint charge of 100 pounds at the first-class rate, but not less than 75 cents.

2. That the joint class freight tariffs carrying out the requirements of this order be published and filed, so as to become effective not later than October 1st, 1919.

3. That the following be made the points of interchanfe of interline freight traffic between the said companies under the terms of this order:

Lennoxville, Montreal, Ottawa, Brockville, Peterborough, Toronto, London, Mount Forest, Orillia, North Bay, Actonvale, Ste. Rosalie, Renfrew, Kingston, Milton, Guelph, Woodstock, Tillsonburg, Inglewood and Essa (Utopia).

(Sgd.) H. L. DRAYTON,
Chief Commissioner,
Board of Railway Commissioners for Canada

Modern Plumbing System Installed in Memorial Town Hall

Installation in Town Where There Are No Sewers or Waterworks. Watch For It in the Next Issue

Details in connection with the installation of the plumbing equipment in the Memorial Town Hall, at the town of Lakefield, Ont., a place of 800, located on the Otonabee River, about nine miles north of Peterborough, will appear in the next, the September 1st issue of SANITARY ENGINEER. The article will illustrate and describe all floor plans, installations and the system of sewage disposal. There are no sewers or waterworks in the town and the complete plant, including well (but excepting the septic tank), will be contained within the building.

The second instalment on "Saving Fuel in Heating Houses" will also appear. This is one of the best yet of the series of Engineering Bulletins being published for our readers.

Then there is another heating article coming from N. A. Kearns, as well as a continuation of the series on "Ventilating the Modern School."

News from Here and There

CONTRIBUTIONS OF NEWS GLADLY ACCEPTED

OBITUARY

The death occurred at Edmonton, Alberta, of J. A. Lockerbie, of the plumbing firm of J. A. Lockerbie, Ltd.

BUSINESS CHANGES

Perth, Ont.—Carson & Butler have succeeded Code & Chaplin, plumbers.

NEW COMPANIES

F. L. Cook, until recently electrical foreman with the Linderman Manufacturing Co., of Woodstock, Ont., and R. E. Kilpatrick, for the past five years with J. Filsinger, plumber, of Sarnia, Ont., have formed a partnership and opened a plumbing and electrical shop at Sarnia.

C. A. DUNHAM CO., LTD., EXPANDS

This company is carrying into force plans for the development of the sale of their line in England. C. A. Dunham, president of the company, has opened offices in London, and A. J. Assheton, formerly sales manager and heating engineer of Metals, Limited, Calgary, has been selected to handle the office and sales organization.

All of the Dunham products for this field will be supplied from the company's plant in Toronto.

The C. A. Dunham Co., Ltd., are building an extension to their plant and a new office building.

FAVORING CANADIAN GOODS MORE

Newfoundlanders are beginning to favor Canadian-made goods more than ever before. This is the opinion of John R. Anderson, manufacturers' representative, Montreal. Mr. Anderson has been over to the Island and stated that conditions there, as well as in the Maritimes, are very satisfactory from a business standpoint. St. John's, of course, is the centre of activity in Newfoundland and there is a good spirit abroad there in a business way.

PICNICKED AT GRIMSBY

The annual picnic of the United Association of Plumbers and Steam Fitters of Hamilton, Ont., held at Grimsby Beach was attended by many of the master plumbers and wholesalers, as well as the members of the association with their wives and families. A long program of sports was run off and as the events were keenly contested, the finishes and various events provided constant amusement for the onlookers. A feature of the afternoon was three baseball games. The first was won by the plumbers, who defeated the steamfitters 13 to 8. In the second the plumbers' helpers defeated the steamfitters' helpers 8 to 7. In the third game the journeymen defeated the master plumbers 12 to 10. The committee which looked after the arrangements and was responsible for the success of the day comprised J. Allen, A. Hunter, C. T. Rodgers, J. Harte, J. Kerr, P. Smith, T. Arthur, R. Lamb, W. Possum, R. Bowes, G. Smith, A. Smith, A. Bonner and H. Lucas.

PROVIDING MORE SEWERS

Surveys and estimates are being made by Engineer Wynne Roberts, of Toronto, for an extensive sewage system for the township which will provide drainage, etc., for Todmorden, Woodbine Heights, Barrington avenue and Dawes road. The estimates will cover a sewage scheme for the whole southeastern portion of the municipality.

It is stated by certain members of council that this work will be started at the earliest possible date and that those districts most in need of sewers would be given the preference.

BUILDING NEW WATERWORKS

As a result of more or less continual trouble from its water supply, and a serious outbreak of typhoid fever last year, the Water Commissioners at Chatham, Ont., have decided to proceed with the construction of a new system, which will provide an ample supply of pure water. The cost is estimated at $200,000. A report which was received on the old waterworks plant stated that it is now out of date, and the erection of a new filtration plan was recommended. The present plant, which contains out-of-date filters, is over-loaded, and certain recommendations were made by the engineer to improve the present supply until the new plant is erected.

The new plant will purify water, for domestic purposes, by a system of rapid sand filtration, and none of the present machinery will be used in the new construction.

MAY PROSECUTE BOARD

A threat to prosecute the members of the Parks Board at Brantford, Ont., was embodied in a resolution written and passed at a meeting of the Board of Health. It is alleged that the Parks Board has not provided proper conveniences at Mohawk Park. Mayor MacBride was the mover. Before any action is taken, however, members of the Board of Health will visit the park and make an inspection. An enquiry will be made to the city engineer re the frequent leakage of sewage matter into the Brantford canal. On the motion of T. J. Minnes and Mrs. Frank it was recommended that the tail race be filled in with selected garbage and the garbage department officials will be interviewed in this regard.

MAY USE CONCRETE MAINS IN BIRMINGHAM EXTENSION

A proposed extension to the waterworks system of Birmingham, England, at a cost of $2,500,000, embodies some features of interest. It is planned to construct a third pipe on the siphon sections of the aqueduct from the Elan Valley to Frankley, and to strengthen the present mains.

The aqueduct which connects Birmingham with the Corporation reservoirs of Mid-Wales is 73½ miles in length and consists of cut and cover tunnel and siphon pipe line. The sections in cut and cover and tunnel have been constructed to convey 75,000,000 gallons a day, the full estimated yield of the gathering ground, while the sections in siphon or pipe line are designed for six lines of pipes, two of which have already been laid, each having a capacity of 12,250,000 gallons per day.

Concrete Mains Suggested

But for the war the construction of the third pipe line would have been put in hand some time ago. That being impossible, the water committee completed all the preliminary work. In 1917 the committee reported that, in view of the liability to bursts to which cast-iron mains had proved subject, inquiries had been made respecting reinforced concrete, and the suggestion had been made that, as pipes of that material were not subject to the same limitations of diameter as those of cast iron, it was worth examination whether the provision of a main of double capacity might not be economically advantageous.

A Difficulty

When the proposal for a main of double capacity was first brought forward, the principal drawback was that it would be necessary to lay the double-capacity main over the whole length of the siphons before any augmentation of the supply could be secured. This difficulty

has now been overcome by means of a system of cross-overs designed by Mr. F. W. Macaulay, the Elan supply engineer, by which the new main can be carried out by instalments, sections being brought into use as they are completed without waiting for the construction of the main throughout.

Laid in Concrete

The present scheme is for the provision of such lengths of main as will be required for the passing of an additional 4 million gallons per day through the Severn and other siphons. The sections of the new main will be laid in reinforced concrete on the "Bonna" system, the diameter to be 60 inches, which is calculated to provide, when completed, a discharging capacity double that of each of the existing mains of 42-inch diameter. The total length of double-capacity main proposed to be laid is 9.17 miles. It is hoped that the work may be completed in time for use in the summer of 1921.

LETTERS TO THE EDITOR

These columns are open to contributions upon any topic of interest to the trade, it being understood that the views expressed are those of the contributors, and do not necessarily imply editorial indorsement. Names of contributors will be withheld, if desired, but name of writer must accompany correspondence as an evidence of good faith.

APPRENTICES.

Editor SANITARY ENGINEER:—I had a likely looking lad who had passed his Matric. come to see about learning the honorable profession of "plumbuming," a likely looking lad with more head above his ears than below them, and he wanted to know so many things that my head is still aching. He came at me like a cyclone. What opportunities does this honorable business offer? I told him if he studied hard and applied his best energies he would some day have a shop of his own. How many millionaires are there in the business? I could think of none so told him I had none on my calling list. What will I have to do to learn this business? I said serve five years. He comes back, "why?" To learn it all it will take you all that time was my answer. What wages do I get when learning? As I thought this kid should not be lost to the trade I said $9 per week first year and a raise of $2 per week each year. "Oh! he said, that is less than a common laborer. What do I get after I have learned the business? I said jours. are making 75c per hour. From the look of things when you are out of your time the scale will probably be $1 per hour. He came back with this, "How many men over fifty are working jour. work? " I said in the old days, when the boys used to take to the trade, old men were scarce as jours. What became of them? he asked. I said some went into busines, some took jobs as stationary engineers. Others, a few, a very few, become inspectors. How many jours. own tin lizzies or real cars? I could not answer this. How many do you know who retired on jours.' wages at 60 years of age? Again I was beat. He comes back with this. What are you trying to pull off? If I start a peanut stand and use all the brains and energy you say I have to for five years I shall have a good business, a car of my own and be better off than plenty of master plumbers. I thought this was the kind of lad the trade needed so tried another tack, and asked him if he did not want to be of service to his kind, to help make this weary old world better for his having lived here, and reminded him that if he learned the trade and followed it he would help to make generations yet unborn better physically and stretch out the life of man a few years longer, and better than that, let them enjoy health while living. He sat up and took notice, but said: "In the old days you used to perfect the profanity of the cub; as that is out of style what will you teach me instead, or how about taking a little time off the apprenticeship? Then the cub used to chase the growler with the new gasoline can and rustle for booze on repair jobs, also learn to fix beer pumps. As the booze is not used any more and I shall not have to spend time on learning them, how about taking another day or two off the total time I have to serve? In the old days the cubs' night school was in a room at the end of a bar, the floor was the drafting table and the chalk that used to mark the baseball score served to illustrate the fine points of the trade, for the cub. Who could save enough to buy a slant once a week for some old timer who looked for the cubs to pay their footing that way? As that is out of the question now where is the cub to learn? Have you any schools to replace it? Will you allow me the time I spend at nights learning this business on my total? Or will you pay for my instruction, and last, will you give me a year in the front shop learning how to figure jobs? Teach me the meaning of 'overhead' and how to handle a customer, land his job, and to impress the general public with the dignity of the profession. I will call around after vacation."

More soon,

"RATSY."

RECONSTRUCTION

Editor SANITARY ENGINEER. — If we are to keep pace with the Bull about reconstruction let us take stock of our own trade first. How much junk must we carry to carry on a repair business simply because things are not standard? How often have supply pipes to come out when bath or basin cocks are to be changed? How many ball cocks fit old supplies? How many different threads on copper floats? I know you will say I use all one make. Oh! do you, well if you only expect to keep your own jobs in shape then you will not expand and other men whose jobs you must repair use other makes. Is it any satisfaction to the customer, the journeyman or to yourself to find that everything is of different size and thread. How about the Dominion Association taking this up? During the war in Britain everything was supposed to be made standard. You can see at a glance what this would mean to a master, journeyman and last, but not least, the consumer, who, to say the least, is the one that we all make a living out of. Oh! don't say or think the public be damned, for in this period we shall find that we cannot get along without them. Now just think this over and put the thing up to the Dominion Association and let us see what they can do with it.

"RATSY."

New Goods Department

KLOSET KLEAN

Kloset Klean, manufactured by the Chamberlain Desolvo Co., Ltd., of Toronto, is made, it is stated, for cleaning closet bowls only, and, it is claimed, it will keep them clean and sanitary. It is also claimed that it will not in any way injure the bowl or affect the pipes or plumbing connections. It is claimed that it will work quickly and thoroughly and that it leaves no fumes, no odor and no dirt.

In Chicago there is a bureau devoted to finding employment for men 45 years and over. It is estimated that over 20,000 men have thus found employment. In practically every case the concerns who hired the men came back for more, which proves you are not by any means a dead one at 45 and over.

THREE GUESSES—WHAT IS HE?

One does not need to take three guesses to determine the line of business this Texas merchant follows. There is a suggestion here which some member of the Canadian trade may wish to follow. The above is a photograph showing G. D. Harris' bathtub auto standing in front of his plumbing establishment at 1704 Commerce Street, Dallas, Texas.—Courtesy The Plumbers' Trade Journal, New York.

Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published—Description of Jobs Done or Shop Kinks Are Also Invited.

PROTECTION OF SEPTIC TANK FROM FROST

The Editor, SANITARY ENGINEER. — I am installing a septic tank in this town, which will not be put into use until the middle or end of September, as the owner of the house is visiting in the East, and will not return till about that time. As that will be rather late in the season I feel that some protection will have to be given the tank to keep it from freezing during the first winter. Will you kindly tell me what protection will be necessary, also how late in the season it would be safe to start a septic tank?

Will the disposal field need any protection (say, a covering of straw or manure?) Is lye in any form injurious to germ-life in the septic tank? A septic tank which I installed 18 months ago is working well, but the scum does not form on top of the water in the settling chamber. My customer has been using home-made soap containing pound of lye to five pounds of grease for laundry purposes, and I wondered if this would prevent the scum forming.—Yours, Western Reader.

Answer.—The warmth of sewage is as a rule sufficient to keep the ground of the disposal field from freezing, and as the proper treatment of the effluent depends so much on a free aeration of the soil it is better to leave the ground uncovered. Of course, the type of the tank used and the class of waste treated have a bearing on the quality of the effluent and this in turn has some effect on the freezing temperature of the liquid.

Now, while there is little, if any, danger of the normal septic tank system becoming ineffective because of frost, the unusual conditions surrounding the particular plant in question may make necessary some protection over the disposal field. If you find the ground around the field tiles freezing you had better cover it with a layer of straw. Do not use manure. The substance treated in the last stages of such a plant are ammonia and the carbonaceous residues. If manure should be used in covering the field you would likely find the ground so soaked with ammonia in the spring that complete oxidation of the effluent would not take place until well on in the following July.

Lye in any form is injurious to the germ life in the septic tank. If more than a normal quantity of lye, or washing compounds, is used a separate disposal plant should be arranged for treatment of such. The small amount of lye used in the ordinary household has no appreciable effect in preventing the proper working of a septic tank system. In some septic tanks no scum ever forms, but its absence does not seem to affect the work of the system. The scum, however, serves the purpose of protecting the sewage from temperature changes, and also prevents the agitation of the liquid, which interferes with sedimentation and anaerobic action. In other tanks so much scum gathers that it contracts the free area of the tank and it is then necessary to break it up by top-flooding. Very little septic action takes place in the scum and while some scum is desirable, its absence does not by any means indicate that septic action is not taking place.

If the ground around the field tiles is kept from freezing until 24 hours after the septic tank is first used, the system may be started at any time.

The tank should not be larger than required for 12 to 24 hours' supply of sewage.

Storm water should not be run into the septic tank.

Editor, SANITARY ENGINEER.—What size would you recommend for a septic tank for an average family? How close to the house; how would you dispose of the sewage after it leaves the septic tank where the house is built on a town lot and you have to confine the filtration to the lot the house is biult on?

SUBSCRIBER.

Answer.—In answering the questions asked we are taking the opportunity of placing before our readers some of the fundamental principles of purification of sewage by the septic tank system.

With an understanding of the principles involved it will become a matter of detail to arrange a purification plant suitable to any peculiar circumstances surrounding the conditions of installation. If sewage is placed in any air and light proof vessel and allowed to remain for a time "septic" action will take place. When the sewage enters the septic tank its flow is retarded with the result that the solid matters settle to the bottom of the tank, where they are changed into iquid and gas by anaerobic bacteria. This act of fermentation will cause some of the deposited material to rise to the surface of the water, when, together with the material that is lighter than the water, they will form a scum or mat. This mat assists in excluding air and light from the sewage and in this way benefits the life of the anaerobic bacteria in the sewage. Litte or no bacterial action takes place in the scum and therefore an excessive thickness of the mat is undesirable. If the mat should grow so fast that it chokes the flow of sewage through the tank it may be necessary at times to break it up by flooding sewage over it.

From two weeks to several months is required for the development of the complete septic action in the sludge. It takes that time for the necessary bacteria to multiply. Some of this matter in the sludge will resist decomposition for months, and although the volume of sludge will remain after a time nearly constant it is necessary to remove some of the sludge at intervals. The length of intervals varies from six months to six years. About one-third of the necessary purification of the sewage takes place in the tank and it is necessary to treat it further before it can be considered as harmless.

The sewage should not stay too long in the septic tank. For fresh sewage 12 hours is a good limit of time. Stale sewage should not remain longer than six hours.

The volume of sewage from the average residence can be estimated as being from 25 to 40 gallons per head per day.

After the fluid leaves the septic tank it must be purified by aeration. The purification here is due to the action of aerobic bacteria and it is therefore necessary at this stage of the process to provide an area where air may come in contact with the effluent.

When the ground is of a porous nature aeration can be obtained by discharging the effluent through 3-inch drain tiles set at from 12 in. to 24 in. below the surface of the ground. It is necessary that this discharge be not continuous, as otherwise the anaerobic-charged effluent will soon kill all of the aerobic bacteria in the ground and in a short time the field will become putrid. When the dosing of the tiles occurs at intervals the aerobic bacteria have time to rest and multiply.

There should be an allowance of one foot of field tile for every gallon of water and at least five square feet of ground area for each foot of tile.

The field tiles should not have a greater fall than 2 inches in 100 feet and they should branch from the main drain at an angle of 45°. The joints should be covered on the top to prevent earth falling in to the pipes from above.

When heavy clay land is encountered it is necessary to sub-drain the field, and also, at times, strip the soil from where the field is stunted and mix a certain proportion of sod with the soil before setting the tiles in place. Where the sub-drains are fairly close to the surface, say 2 ft. 6 in., it will only be necessary to treat the field to a depth of 6 inches below the sub-surface tiles.

If snow falls before a severe frost comes, the protection given by the snow will generally be enough to prevent freezing of the sewage in the disposal field. If deep furrows are run between the tiles there will be little danger from frost. A disposal field of a residence for a family of 8 to 10 persons would cover an area of about 2,000 square feet.

The first chamber in the septic tank should be large enough to contain about 280 gallons; the closing chamber 165 to 180 gallons.

Where the house is set on a large plot of ground the disposal plot is usually set at about 80 to 100 feet from the house; but a septic tank if well built and maintained can be placed quite close (about five feet) to the house without danger. It is, however, well to run the field tile in a direction away from the house, so that no liquid escaping from the disposal bed may find its way back to the foundation walls.

Where the area of the ground is not large enough to allow for the sub-surface system of aeration, it is necessary to build a septic tank along the lines already described, but making the volume of the tank equal to about 350 gallons and dividing the tank into two compartments by a wall reaching to within 20 inches of the floor. The depth of sewage in this tank is to be about 3 ft. 2 in. In the secondary compartment of the tank there is set a 6 in. fine sod filter resting on a bed of pebbles and a grillage of laths. The effluent passes from the first chamber of the tank through this sand filter and thence by overflow to a third chamber containing an aeration field of half gravel, with an area of 14 sq. ft. and a depth of about 3 ft. This aeration chamber is to be well vented and the gravel bed is to be drained by means of 6 lines of 4-in. tiles. The tiles are to be vented at their ends by uprights running through the gravel bed, and opening into the chamber above the water line. The liquid escaping from the drain at the end should be clear of odor. If there is no drain where this water may be run off it will be necessary to provide some kind of a storage tank, where it may be pumped on the land.

If the aeration filter should become clogged or rendered inoperative through any other cause, it will then be necessary to treat the effluent in the storage tank with chloride of lime or some other disinfectant.

DOMESTIC HOT WATER IN CIRCULATING SYSTEM

Sanitary Engineer, Toronto:

Dear Sirs,—Enclosed please find sketch of a contemplated job, viz., two 30-gallon boilers in basement connected to jack heater, to heat water for five basins, laundry tubs, sinks, baths, etc.

The risers for the hot water will go up the partitions separate to each fixture in ½-inch pipe; putting an ½ ft. x ½ inch x ⅜ inch tee below, where the hot water supply runs out to a fixture, and then dropping the ⅜ inch pipe to basement return connection.

Will these drops, viz., ⅜ inch into ½ inch pipe running to boiler returns, and having a fall all of the way back, form a circulating system, so that we will be able to draw hot water from a fixture as soon as the taps are opened?

Will it be necessary to put a ½ inch swinging check in the return at point where pipe enters return at boiler?

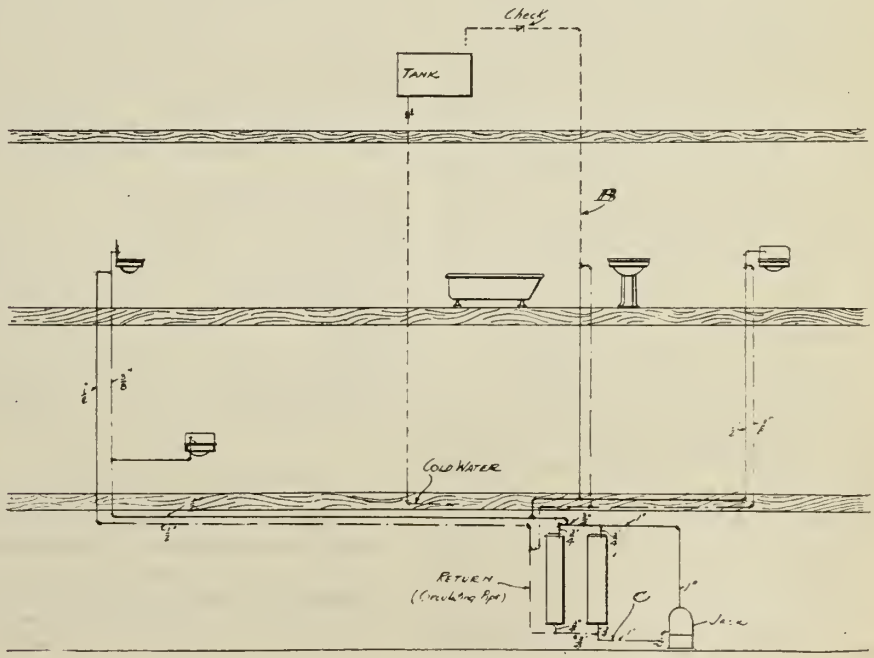
Would you advise an exhaust pipe from the hot water, pipe to go over top of tank, so as to relieve system in case of water getting too hot, or will the circulation of water be enough to cool and avoid this?—Apprentice.

Answer.—In making the accompanying drawing we have not shown the cold water connection to the boilers, so that all piping indicated, with the exception of the main feed from the tank, shows the hot water circulating system only. You will notice that the details of pipe connections between boilers and jack are not the same as shown on your sketch, and that there is also an expansion, or relief, pipe (B) shown on this drawing.

With regard to the jack and boiler feed and return connection the pipes should run a full one inch to the connections close to the boilers and then reduced by means of 1 inch x ¾ inch x ¾ inch tees, as shown, so that the current of water flowing to and from the jack will be divided equally for each boiler.

The return pipe (C) should be kept low enough down to form a trap between the boilers and jack, and then no swing check in the return pipe will be required. An exhaust pipe should be run from the highest fixture branch to a point well above the supply tank. The purpose of this exhaust is not entirely that of a relief for expansion, but mainly as an escape for accumulated air and steam. If the exhaust pipe is not installed, air will gather at the top of every loop in the system and prevent circulation. The height of the exhaust pipe will control the boiling temperature of the water; the higher the pipe, the hotter the water becomes before reaching a steaming temperature. The exhaust pipe also acts as a balancing force in equalizing circulation. Branches to fixture should be taken from the top of loops and not from the sides.

The system if installed as described will give the results required, but if there is room in the attic for an overhead dis-



tributing loop, it would be an advantage to instal the system as an overhead feed, thus doing away with the double set of risers. The plant would then be installed in this way: A pipe could be run right up from the top of the storage boilers to the attic, where it would run out to the drop risers. The drop risers would be connected to a return in the basement, and this return would connect to the boilers and to the jack in a manner similar to that shown on the drawing. The highest point of the overhead loop should be vented, and then should be placed in that vent a light swing check valve set to prevent air entering the system when the hot water tap is opened.

All branches to return piping in basement should have the tees set with their openings looking to the side and not out of the top. This refers to either the double riser or overhead system of circulation.

Rodney, Ont.

Editor SANITARY ENGINEER.—Would you kindly advise me if a 2½-inch pipe would work satisfactory on a pump, the cylinder being fitted for 2-inch pipe?

Yours truly,
D. MISTELE.

Answer.—The 2½-inch connection may be used, but it will reduce the efficiency of the pump by about 40 per cent. If the pump is installed for a lift of about 30 feet you will find that with this connection that the limit of the lift will be 12 feet.

MARKET TENDENCIES

Continued from page 38

sheets and tin plates may be expected within the next few days."

There seems to be a difference of opinion in the market regarding the plate situation. Advices from very reliable sources continue to refer to plate as the weak spot in the steel situation, while others point to the fact that operations are gradually approaching some 70 per cent. capacity at many of the mills. One dealer to-day was willing to stake his reputation on the fact that a higher schedule for plate would be announced inside of a month. This hardly seems likely, as there is a very large plate capacity in the steel centres now, and it can take on a lot more business before coming to the point where capacity will be in sight. Quotations here range as follows:

14 gauge	4 85	5 10
16 gauge	4 96	5 20
18-20 gauge	5 80	....
22-24 gauge	5 85	....
26 gauge	5 90	....
28 gauge	6 00	....
3-16 inch plate	4 90	6 26
¼-inch boiler plate	4 60	5 80

Prices shown are for full cases. An extra charge of from 25c per 100 lbs. is made for less than case lots.

GALVANIZED SHEETS.

10¾ oz.	$7 80	$8 10
U.S. 28	7 40	7 70
U.S. 26	7 10	7 40
22 and 24	6 95	7 25
18 and 20	6 80	7 10
16	6 66	6 96
12 and 14	6 50	6 80

An extra is now charged on galvanized sheets, 10¾ oz. and 28 ga., when shipped out in sheets 3 feet wide. The extra charged over prices shown above is 20c per 100 pounds. Other gauges show no change for different widths.

Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

Higher Prices Named on Solder

LEAD AND ZINC PRODUCTS.—Higher prices are again in evidence on solder this week, this being the second change since last issue, with quotations ranging from ½c to 3c per lb. above last week's figures. The prices now in effect are for the guaranteed, 35½c to 38c per lb.; strictly, 34½c to 37c; commercial, 32½c to 35c; wiping, 31½c to 34c; wire, 35½c to 41c. The strength of the tin market is largely responsible for this move upward.

A firm undertone prevails in manufactured lead products with business active. Prices remain unchanged at figures shown herewith:

Lead pipe, list, per lb.		$0 12½
Lead waste pipe, list, per lb.		0 13½
Do., over 8 inches, list, per lb.		0 14½
Above subject to discount of 10%.		
Lead traps and bends		15%
Lead wool, lb.	0 11	0 12½
Lead sheets, 4 to 6 lbs., sq. ft., in rolls, lb.	0 12	0 13
Cut sheets ½ to ¾c lb. extra and cut sheets to size, 1c lb. extra.		
Solder, guaranteed, lb.	$0 35½	$0 38
Solder, strictly, lb.	0 34½	0 37
Solder, commercial, lb.	0 32½	0 35
Solder, wiping, lb.	0 31½	0 34
Solder, wire, lb.	0 35½	0 41
Zinc sheets, per lb.		0 17

Scrap Market Shows Easing Away

OLD MATERIALS.—The scrap metal market continues strong, though a marked falling away in business is reported, due to unsettled labor situation. It is still marked by a real and acute scarcity in some lines, particularly heavy melting steel. There does not seem to be much of this material to dispose of, and there is also a scarcity of machinery scrap, the demand for this latter being brisk, with the offerings correspondingly poor. There is some speculation as to whether much of these wanted metals is being held back for still greater increases. It would appear that there should be more of this material in the country. It may be that labor is not available to bring it out, or that the price is not tempting enough, but the fact is that it is not making its appearance. Prices show no change from figures herewith:

Dealers' Buying Prices—		
Tea lead		0 03½
Heavy lead pipe		0 05¼
Pipe scrap		6 00
Stove plate, per ton		13 00
No. 2 busheling		11 00
Yellow brass		0 09
Red Brass		0 16¾
Light brass		0 07
Scrap zinc		0 06
Heavy copper		0 18
Wrought iron, No. 1, per gr. ton		14 00
No. 1 machinery cast		18 00
Heavy melting steel		13 50

Tin Higher; Copper Moves Up Also

INGOT METALS.—In a market where advances are quite rapid there very often develops quite a wide range of quotations. This is shown this week in prices quoted on spelter, lead and antimony. Tin is up 5c to 6c per lb., and copper has advanced another cent.

COPPER.—The market is somewhat quieter but there is a strong undertone and higher prices have been named locally, to-day's figures being 27c per lb. There is a very nice volume of business being done.

TIN.—A sharp advance of from 5 to 6 cents per lb. is shown in this metal this week in new price of 61c to 62c per lb. which has been established. Greater activity is shown in sales.

SPELTER.—Quotations show quite a wide range of from 10c to 10½c per lb. A fair volume of business is offering.

LEAD. — Little change in prices is shown this week though the range has widened towards a higher level. Buying is quite brisk with quotations ranging from 7c to 8c per lb.

ANTIMONY. — A somewhat stiffer feeling is apparent in this metal. Prices are named at from 10c to 11c per lb., which represents a 1c advance in some quarters. There is a good amount of business being handled.

ALUMINUM.—New developments are lacking, though somewhat greater activity in sales is noted. The price remains unchanged at 35c per lb.

CANADIAN NATIONAL EXHIBITION NOTES

In order to accommodate the Canadian War Memorial paintings at the Canadian National Exhibition, an extension of 130 by 30 feet to the fine arts gallery is necessitated. Some of the paintings are over 20 feet long.

The "Hell of Death" that faced the Canadians at the second battle of Ypres, when they were sent against the first German gas attack, is vividly portrayed in the War Memorials paintings to be shown at the Canadian National Exhibition this year.

One whole building will be devoted to Canadian war trophies at the Canadian National Exhibition, while the big guns, aeroplanes and other large relics will be distributed around the grounds, giving the big fair a truly victory atmosphere.

H.R.H. the Prince of Wales will spend three days in Toronto during the big fair. He will open the Exhibition on Monday, August 25th, in the open air, where many thousands may see him, and will remain in the city until Wednesday, spending all or part of three days at the Exhibition grounds.

Seventeen American flyers have already entered for the New York to Toronto aeroplane race to be started from the Canadian National Exhibition by the Prince of Wales on August 25, the opening day of the big fair.

Over ten thousand dollars in cash prizes and trophies will be awarded the successful flyers in the Canadian National Exhibition aeroplane race from Toronto to New York and return.

Cols. Barker and Bishop, the world's greatest aces, will have charge of the flying circus at the Canadian National Exhibition this year. They will fly surrendered German Fokkers and types of British, French and Italian machines.

Heating and Ventilating

HOT WATER HEATING SYSTEMS

Tenth Article of Series Prepared for Readers of "Sanitary Engineer" by N. A. Kearns

Editor's Note.—This article is the tenth of a series prepared especially for the readers of SANITARY ENGINEER, covering heating and engineering practice reduced to its simplest terms. Readers will find this article on "Hot Water Heating Systems" a most illuminative one. The first article of the series appeared in the April 1 issue. Descriptions of installations made in different classes of buildings will be given, together with the method used in making the design for these installations. It is not our purpose to give complicated formulas, but rather to present the simple rules that have been based on these formulas, in such a way that the reader will be enabled to design a heating and ventilating system without having to refer to the data given in engineers' hand-books. The author of these articles, Mr. N. A. Kearns, has designed heating and ventilating equipment for all classes of buildings in practically every province of the Dominion. Some of the buildings were such that the heating and ventilating equipment had to be installed under the most adverse conditions, whereas in other buildings the design for the heating and ventilating equipment was incorporated in the constructional drawings. The eleventh article of the series will appear in the next issue.

WHEN the tired engineer is called to listen to the voice of an irate customer complaining that the hot water system (installed by the said engineer) is no good, the chances are that the engineer will be secure in his confidence that the fault lies more with the attendant than with the system.

So many hot water heating plants have been installed in private residences that most journeymen fitters are quite familiar with the details of this work.

The master fitter sends his employees out on work of this kind with a serenity that at times is exasperating to the advocate of other types of apparatus.

About ten years ago the author of these articles had the experience of listening to a happy individual claiming that in five years' time there would be no more hot water heating systems installed. He had a system that had hot water systems faded away to a shadow, and he could see the finish of the hot water advocates. He could not see his own finish—a finish that was to be more dramatic and sudden than the finish of the subjects of his derision.

But do not think that we mean to say that there are no merits in other systems. Far from that, we believe that there are circumstances existing where the installation of a hot water heating system is neither wise nor profitable. And when conditions of that kind arise there are systems of steam and vapor heating which may be installed to the advantage of the engineer and the satisfaction of his client.

It is, however, with hot water systems, both of gravity and forced circulation, that we are now interested, and therefore for the time being must drop anything resembling a comparative criticism of systems.

When the engineer makes a survey of a house to be heated he can, if he is a man of some experience, make a fairly close estimate of the size of apparatus required, basing his figures alone on judgment. But to make the estimate exact, he must go over room by room, measuring the cubic contents to be heated, together with the exposed walls and glass surfaces, and all of the other contributing causes of heat loss.

He may use a rule of thumb in calculating his radiating surfaces, or he may figure back to the theoretical heat loss and proportion the radiator and boiler to that.

One rule that is frequently used in Toronto is that where the cubic contents are divided by 100; the wall by 10, and the glass by 1, the resulting figures of these divisions are added together and the result is considered to be the amount of radiating surface required for each room. A safety factor of from 10 to 20 per cent. of the estimated radiation is added for rooms on the north side of the building, and also for halls. About 20 per cent. of the estimated radiation is deducted from bedrooms.

If he is basing his figures on the heat loss he considers that the efficiency of hot water radiation for gravity circulation is 150 B.t.u. per sq. ft. per hr.

When he comes to the point where he makes a choice of locations for his radiation, he may find that the window stools are so low that it is impossible to set the radiators, of the size required, in these preferred positions; so he makes the next best choice and places the radiators as close to the greatest exposures as circumstances may permit.

After indicating on his plan the sizes of the radiators and their locations, he is ready to lay out the design of the piping. And when he comes to this stage of his work he perhaps decides to use the tappings of the radiators as a basis for the pipe sizes. He finds, upon referring to the catalogues of radiator companies, that hot water radiators are tapped thus—for single or twin connections

Up to 48 sq. ft., 1 in.
Up to 100 sq. ft., 1¼ in.
Over 100 sq. ft., 1½ in.

He may decide to run separate mains to the ground floor radiators, so that the rapid flow of water to and from the higher radiators will not interfere with the flow of water to those set at the lower levels. The main, or mains, leading to the ground floor radiators are taken, as a rule, out of the top of the centre openings of the header on the boiler. The mains leading to the upper floor radiators are generally taken out of openings set farther away from the centre of the header than those feeding the ground floor rods. However, if there is an upper floor radiator set at a very great distance from the boiler, he may decide to give the pipe leading to that radiator a position in the header that will favor a rapid circulation in that direction.

He is always careful to keep his mains pitched up from the boiler in the direction of the flow to the radiators, and to vent every dead end, such as that at the highest point of each radiator.

With a boiler of ample capacity con-

nected to a proper flue, and with radiators properly proportioned to the rooms, the engineer may be confident that the heating plant installed in this way will not be subject to the crankiness of certain other systems.

There is no danger of getting the pipe sizes too small for the work required when the engineer designs the plant with pipe sizes based on radiator tappings. The fault is likely to be pipe sizes greatly in excess of the actual requirements. On a job of less than ten or twelve radiators the excess is hardly worth considering, but when a great many tappings are used it is well for the engineer to base the pipe sizes on the amount of radiation served, and specifying that the radiators be tapped according to a schedule governed by the conditions of the installation. When hot water pipes are too large the flow of water becomes so slow that a very uneven circulation is obtained throughout the system, and as a result some of the radiators on the pipe lines will not get hot unless a hard fire is kept burning in the boiler. Local circulation in pipe lines indicates simply wasted energy, which means wasted heat.

If the rate of flow through the pipes become too high there is a loss of efficiency through friction. The friction may be great enough to counterbalance the temperature head necessary to drive the water to radiators at a distance from the boiler. But friction is not often the cause of poor circulation. The cause is oftener the poor arrangement of the piping. The main feeding a number of radiators must have at least an area equivalent to all of the radiator tappings with which it connects. If you have two radiators with 1 in. tappings the pipe feeding these two tappings must have an area of 1.57 inches. This means that a 1½ in. pipe should be used. It would be better practice to cut down on the size of the tappings, say, to ¾ in. and use even a 1 in. feed, than to cut the feed down to 1¼ and use the two 1 in. tappings.

There are times when it is advisable to run a main or mains to feed both ground and upper floor radiators. In a case of this kind the radiators to upper floors that are fed from near the boiler should have their branches taken at an angle of 45 degrees out of the bottom of the mains. All radiators close to the boiler should have their branches taken out of the sides of the main. Radiators set at a distance from the boiler should have their branches taken out of the top of main. Generally it is advisable to take the branches to upper floor radiators out of the side of mains, with that exception already noted with regard to the radiators close to the boiler.

In the system just described, reductions in the sizes of mains must only be made where branches come out of the tops, otherwise an eccentric coupling must be used and turned in such a way that no pocket is formed in the line where air may gather.

The last radiator on the line must always be one set either on the ground floor or at the basement ceiling.

When a hot water radiator is set below or at the boiler level it is necessary to feed it by way of an overhead loop. This loop should run up to a height at least exceeding twice the distance of the difference between the lower part of the radiator and the top of the boiler. The loop should be vented at its highest point and the radiator should be fed from the pipe on the drop side of the loop. The higher the loop is run the faster the circulation will be through the rad.

The systems described so far in this article are all two pipe. That is, the flow and return pipes are uniform in size and generally in direction. There are some systems when one large pipe is used both as a return and as a feed. The branches leading from the pipe to the feed of each radiator are taken out of the top of the main supply pipe and the return branches are connected to the are some systems where one large pipe as the circumstances may require. This system of piping is used to a greater extent in forced systems than in those where the temperature head is the motive power used in creating a circulation.

Air gathering in the piping or in the radiators is an obstructon to circulation. There is a certain amount of free air that enters a heating plant with every fresh supply of water. Most of this air will escape from the system through the expansion tank vent, but if the water in the system is rapidly heated after it is first admitted there will be some accumulation of air in the higher parts of the radiators. Thus the constant overheating of water in the system with the resulting loss due to over-expansion, and the following refilling of part of the system with fresh water is the genesis of a great deal of the annoyances caused by the necessity of frequently opening the air vents on the radiators.

The law governing the temperature conditions of water with regard to the pressure to which it is subjected is often used to good effect in hot water systems in this way. Between the expansion tank and the system there is set a weight that will hold the water down in the system until a certain temperature is obtained. This weight is usually graded to 10 lbs. pressure, and as a result the water may be heated to a temperature of about 237 degrees Fahr. before any steam is generated. The expansive force tied up in the system causes the water to circulate very rapidly in its effort to equalize the pressure. The weights used must be such that they will never stick, otherwise a violent explosion may occur.

Where two boilers are connected and valved separately, the expansion pipe must be placed on the inside of the valves. It is well in a case of this kind to have two separate expansion tanks. Several serious explosions have taken place here in Toronto because of the omission of such reliefs for the systems.

When the engineer is called upon to design a forced hot water heating system, he is likely to make some pretty glaring errors if he is not well versed in the laws of hydrostatics. It is true enough that men have installed a good many forced water systems, not knowing what the term even meant, but had they known more about this matter when they were first called in to do the work, they would not have been guilty of running pipe lines too large or too small for the work, nor would they have so carefully arranged details that could only be a detriment to the circulation.

In estimating the surfaces of radiation required in a forced system of circulation, a much higher heat transmitting power may be assumed for these surfaces than is the case with gravity systems. Gravity systems are figured for a radiator efficiency of 150 B.t.u. per hr. The efficiency of a square foot of cast iron radiation under the average condition of a forced system is 190 B.t.u. Pipe coils have an efficiency with this type of system of 250 B.t.u. These figures are based on an initial water temperature of about 200 degrees, with a temperature drop of 35 degrees in the main return.

In figuring the pipe sizes required, it is necessary to allow 1.6 gals. of water per minute for every 250 B.t.u. per hour transmitted by way of the radiators.

The quantity of water carried by the mains to and from the radiators is governed by the velocity of the water therein traveling and the diameter of the mains.

The velocities may be taken as 260 ft. per minute in a 3 in. pipe; 320 in a 4 in. pipe; 375 in a 5 in. pipe; 410 in a 6 in. pipe; 450 in a 7 in. pipe, and 510 in an 8 in. pipe.

Feed and return riser pipes are from ¾ in. or a 48 ft. load to 2½ in. on a 600 foot load.

The pump must be just large enough to overcome the friction head, and it should be of the centrifugal type. The careful study of any work on hydraulics will give the data necessary to allow for the friction head due to the velocities and the quantity of water carried in the pipes. Space here does not permit at present the giving of this data, but later on we hope to place before our readers certain principles of the science of hydrostatics that they may find of value in designing work of this kind.

Just as in gravity system, so in forced systems care must be used in preventing the short-circuiting of hot water. Sometimes this is done by reducing the area of the feed or return pipes serving radiators or the parts of the system that are working too fast.

The boiler used in this kind of work must be so built that the circulation within it will be properly equalized. It is a common thing to find only 50 per cent. of the heating surface in a boiler used in an effective way with these systems. When steam boilers are used it is necessary to have some kind of a reheater or generator installed where the water for the system may be heated.

Ventilating the Modern School

Ninth Article of Series Written Especially for "Sanitary Engineer" by N. A. Kearns—First Article of Series Appeared in April 1 Issue

ALREADY there has appeared in this series an article with regard to the importance of locating the ventilating flues in position suitable to the construction and architectural arrangement of the buildings wherein the flues are to be erected.

The responsibility for the location of the flues is not often, as it should be, placed with the engineer designing the ventilating plant. Too frequently the exigencies of the architectural design prohibit the proper arrangement of flues for the heating and ventilating system requested. and it is then necessary for the engineer to design a ventilating system differing in its details with that of the system the school board and the architect first had in their minds.

While it is important that the ventilating engineer's design should not in any way mar the appearance or effect of any other work on the building, it is of greater importance, in at least so far as the ventilating equipment is concerned, that he should choose locations for the fresh air inlets and foul air outlets that will result in a uniform air circulation in the room to be ventilated.

It is, then, with regard to the loction of these openings that our interest at present lies.

First, we will take up the location of the opening or openings whereby fresh air enters the class-room, and in doing this we may consider, for illustration, that the first of our examples is a fresh air face set at a height of eight feet from the floor line of a standard class-room. The fresh air flues are located along one of the interior walls, and the air is driven through the flue, either by a fan or by gravity pressure.

Up to the point when the air enters the class-room fairly constant conditions of pressure and of temperatures exist, but just as soon as the air escapes from the flue it becomes subject to the variations of the temperature and pressure of the atmosphere within the room. It is these varying conditions of pressure and temperature that makes it necessary to frequently provide more than one fresh or foul air opening for each class-room.

The provision of an opening for a fresh air inlet and also the placing of one for a foul air outlet will not always result in an ideal circulation of air. This can be understood by a reference to air movements in a class-room due to temperature conditions alone. For example: The fresh air, as we have already stated, enters the class-room through a face set on an interior wall. In the winter this fresh air is slightly warmer than the air in the room, and therefore it naturally ascends to the ceiling. It is a characteristic of air that it clings to surfaces, so this warm fresh air travels across the room close to the ceiling until it encounters the cooling surfaces of the outer walls, and then becoming chilled it drops toward the floor line. At the floor it drifts across to the foul air outlet, when it escapes to the vent stack. Of course, the heat of the radiators, located under the windows, has some effect in creating an upward current of air along the coldest location of the room, and this results in a direct disturbance of the air currents here; but this disturbance is not in itself sufficient to greatly offset the general air circulation, and therefore need not be taken into account. The movement of air in a room during the winter months is, therefore, generally downward on the exterior walls.

But now the hot summer comes along, and the outer walls are heated from the direct rays of the sun. The fresh air driven into the rooms is likely to be cooler than the air in the room, and therefore it naturally drops to the floor line. If the vent face is placed at the floor the fresh air will not circulate in the room, but will pass directly through that face, and to the vent stack. If a vent face is placed close to the ceiling, the cold fresh air will pass across the floor and upward on the warm outside walls to the ceiling, where it will drift across to the vent and escape.

The circulation of air has been described here as taking direct paths, and while it is true that the general circulation is along these lines, the point must not be forgotten that the chemical and physical properties of the air are constantly undergoing changes that tend to split the currents up in such a way that an equable circulation of air is obtained practically throughout the volume of the room.

The direction of air currents may be discovered by making use of toy balloons filled with hydrogen gas and counterweighted to make them stable. These balloons may be set in the fresh air openings, from whence they will be carried by the air current through the paths described. Or an ammonium-chloride test may be made in this way: Two bottles are obtained, one containing hydrochloric-acid and the other ammonium-hydroxide. Tubes are to be placed through the corks of the bottles and an atomizer bulb and nozzle arranged in such a way that the compression of the bulb will force air through the two bottles at the same time and unite the fumes at the nozzle; the result will be a small puff of smoke that will not settle out of the air. The smoke from black powder discharged in the fresh air flues will not give a very accurate indication of the air movement; although it is a test frequently resorted to by many architects and engineers.

The arrangement of fresh air flues and faces, so far described here, is that where dilution of the foul air is the principle on which the ventilating system is based. In many public buildings a direct displacement of foul air is desired, and it is then necessary to arrange all of the fresh air inlets and the foul air outlets as far apart as possible.

In direct displacement systems the fresh air is often introduced through one side of the room and the foul air driven out of the other side. Or this air may come in at the floor line and be exhausted at the ceiling, or the vice versa. With the direct displacement the action of positive flushing takes place. However with such a system there is a danger of pockets of dead air being formed in the corners of the room, unless an adequate number of inlets and outlets are provided.

More heat must be supplied to the room where the direct displacement action occurs than where a dilution system is installed; but, as the direct displacement system requires that the air openings be well distributed throughout the area of the room, a less volume of fresh air is required than in the dilution system.

One method of providing a direct displacement system is to introduce the fresh air on the exposed side of the room of exhausting the foul air from the other through faces set in the vent flues on the inside walls. A more expensive, but a better, system is to drive the fresh air through channels under the floor, connecting these channels to mushroom diffusing heads set under each seat. The area of these mushroom heads may be adjusted to equalize the circulation through the room. The foul air is exhausted through openings in the ceilings, connected to channels similar to those under the floors. In some systems the fresh air comes into the rooms at the ceilings and the foul air escapes to the vent flues through the mushroom heads at the floor.

Mushroom systems of ventilation are used to a great extent in theatres and churches, and but rarely—at least in this country—in public schools. Their omission from public schools is not, in our opinion, due to any inherent defect of the system, but rather on account of the expense necessary to the installation.

SELLING GOODS AT THE MARKET

Is a merchant always justified in marking up his stock to keep pace with wholesale market quotations?

"It is simply rank profiteering," a farmer told George F. Sharp, a general merchant at Gull Lake, Sask.

"Listen," Mr. Sharp said to him. "Suppose you purchased a horse for $200, and on account of the world shortage the price of horses went up to $300 within the next six months, would you be such a rank profiteer as to ask $300 for your horse, or would you take what you consider a fair price of $225? If you did you would lose $75, because in buying another horse you would have to pay the full market value."

"I begin to see the light of day," said the farmer.

Market Conditions and Tendencies

STATEMENTS REGARDING SUPPLIES AND TREND OF PRICES

THE MARKETS AT A GLANCE

AN advance is to be made immediately in pipe fittings. Manufacturers have withdrawn all quotations and new ones are being worked out. It is stated that the new figures may show an increase as high as fifteen per cent. in many cases.

New and higher figures are also in effect on soil pipe and the approximate advance is ten per cent.

Shortage of goods is causing some anxiety in many quarters. This situation is increased by slow deliveries. One jobber stated to SANITARY ENGINEER that he had been unable to get the shipments of bath tubs he required because no legs for them were obtainable. Others are complaining about shortages of soil pipe and so on. One firm has more than 800 residences to supply and is finding some difficulty in getting the goods.

Business in general has been excellent and from inquiries that are coming in it will increase. In addition to a large number of dwelling houses being built, plans are being prepared for many more and in addition to this work many large projects are under way which will mean the expenditure of large sums in the spring and at different times next summer.

The settlement of a number of labor difficulties is enabling manufacturers to increase much needed production and they are hoping that from now on this situation will steadily improve and that they will be able to take full advantage of the splendid trade that is developing.

During the week some substantial orders have been placed for marine goods. This will greatly stimulate a branch of the trade that had been a little quiet.

Ingot metals are showing more steadiness than for some time, although conditions are being affected by labor troubles. Lead is strong. Copper, after advancing steadily, has steadied and no changes have been recorded recently. Prices of tin advanced five cents, but the upward movement has stopped. Business has been active in most lines of ingot metals.

Toronto, August 13. — Shortage of goods is apparent in many lines in the plumbing and heating trades, and is delaying work. Orders have been coming in so briskly that many manufacturers are getting behind with their deliveries and the situation is aggravated by difficulty in obtaining help. The building business is especially active and promises to remain so as many large projects are getting under way and others are planned. It is estimated that more than $5,000,000 worth of new dwellings will be under construction shortly in Toronto alone, for the housing commissions. There has been renewed activity in orders for marine goods and manufacturers have enough work on hand to keep them going now for some time. Many of the workers who have been on strike in various metal trades are now back at work and there is urgent need for greater production.

Enamelware Prices Are Holding Firmly

ENAMELWARE.—Slow deliveries of goods are causing some annoyance and with business coming in as it has been the manufacturers state that this condition is likely to be worse rather than improve. The building permits continue to increase steadily and great activity in construction work is apparent, especially in projects calling for various lines of enamelware. Prices are holding firm, the quotations on some of the well known lines being as follows:

Bath tubs, rill rim, 4, 4½, 5 feet, 24 to 30 in. wide		$35 30
Bath tubs, 5½ ft.		39 25
Basins, flat back, 14 x 15 in.		6 80
Do., corner, 15 in.		7 50
Sinks, roll rim, 18 x 30 in.		15 80
Sinks, flat rim, 20 x 30	$6 75	6.65
Do., 18 x 30	5 80	5 90
Do., 18 x 24	5 37	5 25
Do., 16 x 24	5 17	5 05
Do., 14 x 20	4 45	....
Closets, oak tank and seat	....	25 50
Do., enamel iron or white vitro tank	....	27 50

No Changes Shown in Range Boilers

RANGE BOILERS.——There has been a good demand for range boilers. Prices show no changes and manufacturers are not looking for any to take place in the near future they state. With a large number of dwellings being constructed and plans for more getting under way continually the outlook for business is good. Quotations are as follows:

Range Boilers	Standard	Extra Heavy
30-gallon	$11 00	$12 50
35-gallon	13 50	15 50
40-gallon	15 25	17 25
52-gallon	20 50	25 00
66-gallon	32 00	38 00
82-gallon	40 00	47 00
100-gallon	50 00	58 00
120-gallon	60 00	67 00

Soil Pipe Higher, Fittings to Advance

SOIL PIPE, FITINGS.—New quotations, which are 10 per cent. above former figures, are now in effect on soil pipe. Business has been very active and manufacturers are having difficulty in keeping pace with orders.

Prices have been withdrawn on fittings and new ones will be named shortly. These are expected to show an advance which may run as high as fifteen per cent. The old quotations were as follows:

Medium and extra heavy soil pipe, 2, 3 5 and 6 in.	10%
Medium and extra heavy soil pipe, 4 in..	15%
Medium and extra heavy soil pipe fittings, 2 in. to 6 in.	25%
8 in. extra heavy pipe and fittings	5%

PIPE FITTINGS

Cast iron fittings	20%
Plugs	35%
Bushings	35%
Unions, ¼" to 2½"	50%
Do., 1⅛", 3" and larger	45%
Dart unions, ¼-inch to 2-inch	25%
Do., 2½-inch and larger	15%
Nipples, up to 4-inch	80%
Do., 4½-inch and larger	70%
Do., running thread 4-in. and under	50%
Couplings, 4-in. and under	40%
Do., 4½-in. and larger	20%

MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittings, Class A, lb.	$0 50	$0 60
Do., Class B, lb. net	0 22	0 30
Do., Class C, lb. net	0 14	0 21

Brisk Demand For Brass Steam Goods

VALVES.—There has been considerable activity in these goods and inquiries indicate that further business is developing. Some nice orders for marine requirements have been received. Prices

W H O

STOOD BY THE PLUMBERS OF CANADA during the war and furnished them with goods during the most critical situation in the history of the trade?

NOT ONLY MADE MUNITIONS IN SUCH large quantities that an endless stream of shells was sent overseas to the men in the first line of defense, but kept on turning out Made-in-Canada quality plumbing brass goods for the Canadian trade?

NOT ONLY WAS THE FIRST FIRM in Canada to oversubscribe their quota in the Victory Loan of 1918, but also supplied plumbing goods needed by the Canadian merchants?

NOT ONLY DID THEIR BIT FOR THEIR COUNTRY at war, but fulfilled their obligations to their customers in Canada at the same time?

THE
H. MUELLER MAMUFACTURING CO., LTD.
SARNIA, CANADA

We make Bibbs | Compression
Rapidac (quick comp.)
Self-Closing | **Basin Cocks,**

Bath Cocks, Bath Supplies, Basin Supplies, Sill Cocks, Wash Tray Bibbs, Curb Cocks, Corporation Cocks, Tapping Machines, Service Clamps, Ferrules, Regulators, Reducing Valves, Relief Valves, Water Strainers, Bubbling Fountains, Gas Cocks, Globe Valves, Forgings in Brass and Aluminum, Special Castings.

are holding firmly and are expected to remain so owing to the situation in the copper market. Quotations are as follows:

Compression work, standard	44
Fuller work, standard	40
Basin cocks, No. 0 standard	35
Nos. 1 and 2	35
Bath cocks, compression	45
Bath cocks, Fuller	40
Flatway stop and waste cocks, standard	44
Roundway stop and waste cocks, standard	44
Brass steam cocks, standard	Net List
Globe, angle and check valves, standard	23%
Do., removable disc	22%
Radiator valves, standard	31%
Do., removable disc	Net List
Basin Cocks—	
No. 0 and 1, Fuller pattern	40
Compression	35
Quick opening	45
Globe, angle and check valves, standard, medium pressure	23%
Radiator valves, standard med. pressure	31%
Radiator valves, removable seat, medium pressure	25

No Changes Shown in Wrought Pipe Prices

WROUGHT PIPE. — Business in wrought pipe has been very active. While an advance in prices would occasion no surprise, no change has been made in the quotations, which are as follows:

WROUGHT PIPE

Price List No. 40, July 4, 1919

Standard Buttweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
⅛ in.	$ 6 00	$ 8 00	$.....	$.....
¼ in.	4 53	6 66	5 13	7 26
⅜ in.	4 53	6 66	5 13	7 26
¾ in.	5 99	7 57	6 84	8 42
½ in.	7 53	9 66	8 68	10 81
in.	11 14	14 28	12 84	15 98
1¼ in.	15 07	19 32	17 37	21 62
1½ in.	18 01	23 10	20 76	25 85
2 in.	24 24	31 08	27 94	34 78
2½ in.	38 90	49 73	.....	.....
3 in.	50 87	65 03	.....	.....
3½ in.	64 86	81 88	.....	.....
in.	76 85	97 01	.....	.....

Standard Lapweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
2 in.	$ 27 94	$ 34 78	$ 31 64	$ 38 11
2½ in.	40 66	51 48	46 51	57 33
3 in.	53 17	67 32	60 82	74 97
3½ in.	66 70	83 72	75 90	92 92
4 in.	79 03	99 19	89 93	110 09
4½ in.	88 00	113 00	107 00	132 00
5 in.	103 00	132 00	125 00	154 00
6 in.	133 00	171 00	162 00	200 00
7 in.	175 00	224 00	211 00	259 00
8L in.	184 00	235 00	221 00	273 00
9 in.	254 00	324 00	305 00	376 00
10L in.	235 00	301 00	283 00	349 00
10 in.	303 00	387 00	365 00	449 00

Terms, 2% 30 days, approved credit.

Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Boiler Tubes Reveal Strong Tone

BOILER TUBES. — Seamless tubes seem about due for an increase, although the new prices are not announced yet, but it is understood the warehouses are calling in quotations that were made some days ago, and which have not been closed with. The increase will probably be about 2½ per cent., and the only good reason for it seems to be that there is a great demand for tubes just at this time, and many of the mills are booked well into the future. Quotations range as follows:

BOILER TUBES—	Seamless	Lapweld
1¼ inch	$27 00	$.....
1½ inch	28 00	.....
1¾ inch	30 00	26 00
2 inch	30 00	26 00
2¼ inch	33 00	28 00
2½ inch	40 00	32 00
3 inch	46 00	38 00
3¼ inch	.....	45 00
3½ inch	56 00	42 00
4 inch	70 00	54 00

Oakum Very Fine; Waste Unchanged

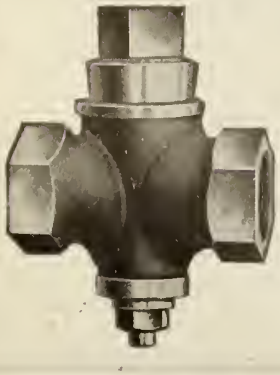
WASTE, OAKUM.—The market on oakum is showing greater strength, though no actual price change is recorded as yet. The demand is brisk and outlook considered satisfactory. No change has been made in waste prices from those noted last week.

	Per 100 lbs.
Best American	$21 00 $22 00
Clipper, spun	21 00
Do., unspun	10 50
Plumbers' spun	9 50

Firm Market Prevails in Sheets

SHEETS, PLATES.—Strength marks the position of sheets this week locally. Sheets have gone up at the mills in some places, although there has been no increase at the warehouses. Advice received by SANITARY ENGINEER on the sheet situation this week states: "We believe that all of the mills are entirely sold up for third quarter delivery, and we know of no manufacturer as yet quoting jobbers for shipment throughout the fourth quarter." The same advice goes on to state that: "Further advances in prices both upon

Continued on page 32



FIVE WORKS---OVER 3,000 EMPLOYEES

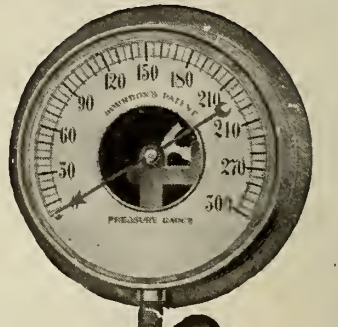
UNITED BRASSFOUNDERS AND ENGINEERS, LIMITED

EMPRESS FOUNDRY, CORNBROOK, MANCHESTER, ENG.

DURING THE WAR our plants were exclusively engaged on work of supreme national importance.

At the commencement of the new era we are pleased to announce that we intend to again direct our energies to the intensive production of:—

GUNMETAL and BRASS VALVES and COCKS.
STEAM, WATER and COMPRESSED AIR FITTINGS GENERALLY.
CAST IRON STOP and SLUICE VALVES.
SEMI-ROTARY PUMPS.
EXTRUDED BRASS and BRONZE BARS.
BRASS BOLTS and NUTS, STUDS and GENERAL TURNED WORK FROM THE BAR.
CAST AND MALLEABLE IRON COCKS and PIPE FITTINGS.
PRESSURE and VACUUM GAUGES.
INJECTORS and GENERAL JET APPLIANCES.
ENGINE GOVERNORS (Pickering, Proell, and Other Types).
SPRAYING MACHINES, for Insecticides and Lime-washing.
COPPERSMITHS' WORK.
"STELLA" BRAND ALLOYS: MANGANESE COPPER, SILICON COPPER, FERRO ZINC, PHOSPHOR COPPER and TIN, etc.



"UBEL" POST-WAR SERVICE

If you are interested in any or all of the lines mentioned, and are in a position to take a hand in the energetic distribution of the same, please communicate with us NOW to our Head Office, at above address.

"Morrison" Gauges

Include Recording Pressure and Temperature Gauges, Blast Pressure Gauges, Standard Test Gauges, Hydraulic, Altitude and Sprinkler Alarm Gauges, Combination Water Works Gauges, Steam, Vacuum, Locomotive and Duplex Gauges, Pyrometer Gauges, Engineers' Clocks and Revolution Counters, Pressure Gauge Testers, Pyrometers for Bakers' Ovens, Thermometers for Heating Installations, Feed Water, Flue, Gas, etc.

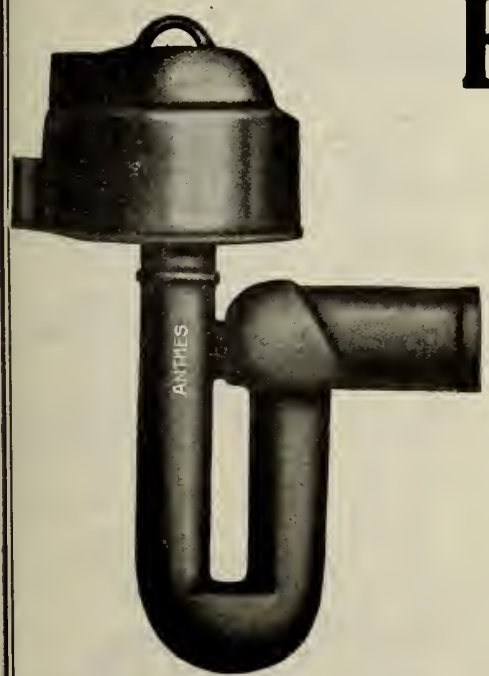
"J.M.T." is seen on most all Canadian Working Drawings and Specifications. You may expect frequent calls for Morrison goods.

The James Morrison Brass Mfg. Co.

Limited

93-97 Adelaide St. W., Toronto, Ontario

Are You Sharing in Rural Prosperity ?



For the installing of domestic sewerage much depends on the selection of the syphon. If the syphon fails to do its part the result is unsatisfactory, time and labor is lost, and the responsible person is discredited and loses business.

The Anthes Syphon is dependable. It is cast all in one piece with no joints to leak. It operates strictly in accordance with natural laws.

We will furnish you with Sewage Disposal Blue Prints on request.

Prompt Shipments.

Anthes Foundry Co., Limited

Toronto and Winnipeg

Classified Buyers Guide

Occasionally advertisements are inserted in the paper after this page has gone to press. The insertion of the Advertiser's name on this page is not part of the advertising order, but is inserted solely for the convenience of the reader of the paper

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Wm. B. Scaife & Sons Co., Oakmont, Pa.

AIR LINE SYSTEMS
C. A. Dunham Co., Ltd., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

AIR VALVES
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Beaton & Corbin Mfg. Co., Southington, Conn.
Canadian Wolverine Co., Ltd., Chatham.
C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.
United Brassfounders and Engineers, Ltd., Cornbrook, Manchester, England.
Wallaceburg Brass & Iron Mfg. Co., Ltd., Wallaceburg, Ont.

ASBESTOS GOODS
James Morrison Brass Mfg. Co., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

BOILERS, STEAM OR HOT WATER
Gurney Foundry Co., Limited, Toronto.
Wm. B. Scaife & Sons Co., Oakmont, Pa.
Lord & Burnham Co., Ltd., Toronto.
Modern Heating & Eng. Co., Ltd., Montreal.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.

BOILER FEED REGULATORS
Empire Mfg. Co., London and Toronto.
C. A. Dunham Co., Ltd., Toronto.
James Morrison Brass Mfg. Co., Toronto.

BOILER FITTINGS
Fittings Limited, Oshawa.

BOILER STANDS
Fittings Limited, Oshawa.

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Joseph Breeden & Co., Ltd., Birmingham, Eng.
Canadian Brass Co., Ltd., Galt, Ont.
Canadian Wolverine Co., Ltd., Chatham.
C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Limited, Galt.
G. & W. G. Gummer Ltd., Rotherdam, Eng.
Kerr Engine Co., Ltd., Walkerville.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.
Wallaceburg Brass & Iron Mfg. Co., Ltd., Wallaceburg, Ont.

BRASS PIPE AND TUBE
Canada Metal Co., Ltd., Toronto.
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

CELLAR DRAINERS
Galt Brass Co., Limited, Galt.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

CHAIN WRENCHES
Trimont Mfg. Co., Roxbury, Mass.
J. H. Williams Co., Brooklyn, New York.

CLOSETS
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Limited, Galt.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Standard Sanitary Mfg. Co., Ltd., Toronto.
United Brass & Lead, Ltd., Toronto.

COUNTRY RESIDENCE EQUIPMENTS
Empire Mfg. Co., Ltd., London and Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

DAMPER REGULATORS
C. A. Dunham Co., Ltd., Toronto.

DRAINAGE FITTINGS
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Fittings Limited, Oshawa.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.
United Brassfounders and Engineers, Ltd., Cornbrook, Manchester, England.
Warden King, Ltd., Montreal.

DRINKING FOUNTAINS
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

EJECTORS, STEAM
Kerr Engine Co., Walkerville.
James Morrison Brass Mfg. Co., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

ENAMELWARE
Amherst Foundry Co., Ltd., Amherst, N.S.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Limited, Galt.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Port Hope Sanitary Mfg. Co., Ltd., Port Hope.
Standard Sanitary Mfg. Co., Ltd., Toronto.

ENGINEERS
Modern Heating & Eng. Co., Ltd., Montreal.

ELECTRIC PUMPING MACHINERY
Empire Mfg. Co., Ltd., London and Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

EXPANSION TANKS
Wm. B. Scaife & Sons Co., Oakmont, Pa.
Toronto Hardware Mfg. Co., Ltd., Toronto.

FUEL SAVING DEVICES
Modern Heating & Eng. Co., Ltd., Montreal.

FITTINGS
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Fittings Limited, Oshawa.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

FITTINGS, CAST IRON, SCREWED, FLANGED, DRAINAGE AND MALLEABLE, SCREWED
Fittings Limited, Oshawa.

FILTERS (WATER)
Wm. B. Scaife & Sons Co., Oakmont, Pa.

FLUSHOMETERS
Canada Metal Co., Ltd., Toronto.
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Standard Sanitary Mfg. Co., Ltd., Toronto.

FLOOR AND CEILING PLATES
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Beaton & Corbin Mfg. Co., Southington, Conn.
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., London and Toronto.
Fittings Limited, Oshawa.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
James Morrison Brass Mfg. Co., Toronto.

FURNACES
Gurney Foundry Co., Limited, Toronto.
Steel & Radiation, Ltd., Toronto.

GAS APPLIANCES
Consumers' Gas Co., Toronto.

GASOLINE ENGINES
Empire Mfg. Co., Ltd., London and Toronto.

GAS WATER HEATERS
Consumers' Gas Co., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

GLOVES, WORKING
R. G. Long & Co., Toronto.

GRATES FOR RANGES, FURNACES AND BOILERS
McIntyre & Taylor, Toronto.

GREY IRON CASTINGS
Fittings Limited, Oshawa.

HEAT GENERATORS
Galt Brass Co., Galt, Ont.
James Morrison Brass Mfg. Co., Toronto.

HEATING APPARATUS
C. A. Dunham Co., Ltd., Toronto.
Modern Heating & Eng. Co., Ltd., Montreal.

HEATERS
Lord & Burnham Co., Ltd., Toronto.
Modern Heating & Eng. Co., Ltd., Montreal.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal and Toronto.

HEATING SYSTEMS
C. A. Dunham Co., Ltd., Toronto.
Modern Heating & Eng. Co., Ltd., Montreal.

HOT WATER COILS, DOMESTIC
McIntyre & Taylor, Toronto.

KNITTED GOODS, WORKING
R. G. Long & Co., Toronto.

LEAD
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Hoyt Metal Co., Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

MALLEABLE IRON CASTINGS
Gurney Foundry Co., Limited, Toronto.
Fittings Limited, Oshawa.

MIXING VALVES
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Port Hope Sanitary Mfg. Co., Ltd., Port Hope.

MONKEY WRENCHES
G. & W. G. Gummer, Ltd., Rotherham, Eng.
Trimont Mfg. Co., Roxbury, Mass.

OVERALLS
R. G. Long & Co., Toronto.

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Canadian Wolverine Co., Ltd., Chatham.
Canadian H. W. Johns-Manville Co., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.

PACKLESS RADIATOR VALVES
Kerr Engine Co., Walkerville.

PIPE AND RADIATOR HANGERS
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Beaton & Corbin Mfg. Co., Southington, Conn.
Fittings Limited, Oshawa.

PIPE, BLACK AND GALVANIZED
Canadian Tube & Iron Co., Ltd., Montreal.
Consumers Metal Co., Ltd.
Empire Mfg. Co., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.

PIPE CLEANSER
Borden Canadian Co., Ltd., Toronto.
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Chamberlain Desolvo Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
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Canadian Wolverine Co., Ltd., Chatham.

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James Morrison Brass Mfg. Co., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.

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Anthes Foundry Co., Toronto and Winnipeg.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Toronto Hardware Mfg. Co., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.
Warden King, Ltd., Montreal.

PIPE THREADING TOOLS AND MACHINERY

Borden Canadian Co., Toronto.
John Hall & Sons, Ltd., Brantford.
A. B. Jardine & Co., Hespeler.
Wells Bros., of Canada, Galt.

PIPE WRENCHES

Borden Canadian Co., Toronto.
Trimont Mfg. Co., Roxbury, Mass.
J. H. Williams Co., Brooklyn, New York.

PNEUMATIC WATER SUPPLY TANKS

Empire Mfg. Co., London and Toronto.
Wm. B. Scaife & Sons Co., Oakmont, Pa.

PORCELAIN WARE

Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
R. MacDougall & Co., Ltd., Galt.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

RADIATOR FOOT RESTS

Beaton & Cadwell Mfg. Co., New Britain, Conn.

RADIATORS

Gurney Foundry Co., Limited, Toronto.
Lord & Burnham Co., Ltd., Toronto.
Steel & Radiation, Ltd., Toronto.
Warden King Ltd., Montreal.

RADIATOR TRAPS (STEAM)

Canadian H. W. Johns-Manville Co., Toronto.
C. A. Dunham Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

RANGE BOILERS

Wm. B. Scaife & Sons Co., Oakmont, Pa.
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REDUCING PRESSURE VALVES

C. A. Dunham Co., Ltd., Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

ROOF FLANGES AND FLASHINGS

Canada Metal Co., Ltd., Toronto.
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RUBBER GOODS

Canadian Consolidated Rubber Co., Ltd., Montreal.

SASHWEIGHTS (Patent Eye)

Fittings Limited, Oshawa.

SEPTIC TANK VALVES AND SYPHONS

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Hoyt Metal Co., Toronto.

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Empire Mfg. Co., Ltd., London and Toronto.
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James Morrison Brass Mfg. Co., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

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STOVES

Gurney Foundry Co., Limited, Toronto.

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Gurney Foundry Co., Ltd., Toronto.

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TESTING PLUGS

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Fittings Limited, Oshawa.

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H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Trimont Mfg. Co., Roxbury, Mass.
Williams, J. H., & Co., Brooklyn, N.Y.

UNIONS

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Empire Mfg. Co., Ltd., London and Toronto.
Fittings Limited, Oshawa.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

VAPOR HEATING SYSTEMS

C. A. Dunham Co., Ltd., Toronto.

VITRO TANKS

Galt Brass Co., Ltd., Galt.

VACUUM SYSTEMS OF HEATING

C. A. Dunham Co., Ltd., Toronto.

WATER SUPPLY TANKS

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WATER SUPPLY SYSTEMS

Empire Mfg. Co., London and Toronto.

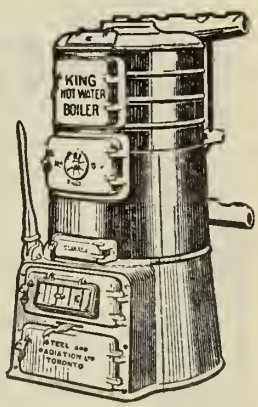
WASHERS, BUILDERS'

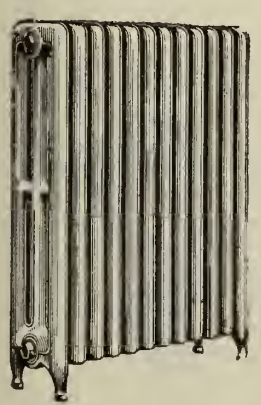
Fittings Limited, Oshawa.

WASHING MACHINES

Gurney Foundry Co., Limited, Toronto.

KING HOT WATER BOILERS AND IMPERIAL RADIATORS





Heating Systems that Ensure Satisfied Customers

Don't gamble with your reputation by installing ordinary heating systems. Even if you make a little more money on such a system, you absolutely can't afford to take the risk. King Hot Water Boilers and Imperial Radiators are mechanically perfect and form an unbeatable heating combination.

The exceptionally low fuel consumption of the King Boiler makes it a general favorite wherever it is used. The "thin waterway" construction of King Boilers ensures an even distribution of heat. If it's satisfied customers you want, recommend and install "The system that gives satisfaction"—King Boilers and Imperial Radiators.

STEEL AND RADIATION, LIMITED

Manufacturers of Hot Water *and* Steam Boilers *and* Radiators; Fenestra Steel Sash *and* Concrete Reinforcing

Head Offices: Fraser Ave., Toronto **Sales Offices: Quebec, Montreal, Toronto**

Western Agents: The J. H. Ashdown Hardware Company, Limited, Winnipeg

A Complete Stock of all Lines is Carried at our Montreal Warehouse

Over 60,000 Daisy Hot Water Boilers Now in Use. Are *You* Selling Your Share?

Daisy Hot Water Boilers are easiest to sell because they have an established reputation for exactly meeting the requirements of the modern home.

Every Daisy you instal will help build bigger business by bringing repeat orders for installation in neighboring homes later.

WARDEN KING, Limited, Montreal

BRANCH OFFICE. 136 SIMCOE ST., TORONTO

Quaturn Ball Cock

Did you ever sell a **whistling, noisy Ball Cock?** It didn't advertise you very well, did it? And very likely your customer was not much pleased either.

Next time use Quaturn.

Because, under moderate pressure, they operate quickly, positively and noiselessly.

Because the working parts may be renewed when worn, without taking off the body, and they are interchangeable with all other Quaturn fixtures.

Because they close with the pressure and therefore tend always to close tighter, eliminating leaks.

Because a satisfied customer means more business for you.

THE WALLACEBURG BRASS & IRON MANUFACTURING COMPANY, LIMITED

WALLACEBURG, ONT.

Toronto
10 Wellington St. E. Phone: Main 2355
Mr. L. N. Vanstone

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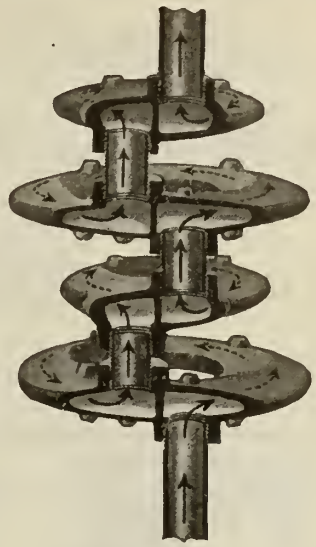
BY installing "IMPERIAL" heaters, you serve your customers' interests, as well as your own.

"IMPERIAL" heaters, are made in three sizes, for the ordinary, heavier, or heaviest requirements.

PERFECT HEAT baffling. Absolute water CIRCULATION.



Sectional View Showing Water Flow

POWERFUL. ECONOMICAL.

For either ARTIFICIAL or NATURAL Gas.

IMPERIAL CITY HEATERS, LIMITED

SARNIA, CAN.

Mark of Proof Is Proof of Quality

There's proved and certified strength in every

WILLIAMS' IMPROVED "VULCAN" CHAIN PIPE WRENCH

Each and every Flat Link Chain is "proof-tested" to two-thirds of its listed catalog strength in a standard tension machine. To each chain so tested is attached the Gray Leaden Seal, illustrated above, and every Flat Link Chain leaving our works *must* bear this seal—the Proof of Quality—as evidence that it has passed our standardized "proof-tests."

Look for this Mark of Proof for it is Proof of Quality—it guarantees uninterrupted, severe service as well as safety to the operator. Williams' "Vulcan" Chain Pipe Wrenches are the *only* Wrenches which offer this certified assurance.

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117 years old Founded 1802

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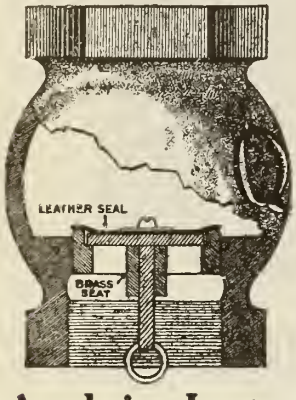

This is a "Q" Foot Valve

And it Just *CAN'T* Leak

There are more pump troubles caused by "leaky" valves than from all the wear and tear which occurs in the average life of a pump.

The "Q" valve will overcome all priming troubles, and water once raised above it, through the suction line, will not leak out.

If you want the pumps you instal to give maximum, you will require to use the only valve on the market that JUST CAN'T LEAK.

Made in sizes from 1 to 8-inch.

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The Wrench of 25% Greater Efficiency

TRIMO PIPE WRENCH

Two new features have been recently added to the Trimo Pipe Wrench, namely Nut-Guards, in all sizes, and unbreakable steel frames, in leading sizes.

The Nut-Guards prevent the accidental rotation of the nut while in use.

These improvements add 25% to the usefulness of the tool.

The Trimo Pipe Wrench is made with wood handles in 4 sizes, 6-in., 8-in., 10-in., 14-in. and in steel handles in all sizes, 6-in. to 48-in. inclusive.

All Trimo Pipe Wrench parts are interchangeable.

The inserted jaw in the handle can be readily replaced when worn, thus adding to the life of the tool.

Nut with Nut-Guards

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Cable Address: Triwrench
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The K-T FOUNDRY

Trade K—T Mark

GALT ONT.

STANDARD

Soil Pipes and Fittings are of pleasing design and good finish. They look good and they **are good**

SPECIALS

Range Boiler Stands are adjustable to 30-35-40 gallon boilers, and you can connect directly under the boiler. Inexpensive but flawless.

Your jobber can supply our goods--if you ask for them

INDEX TO ADVERTISERS

Amherst Foundry Co. ....Inside Front Cover
Anthes Foundry, Ltd. 39
Armstrong Mfg. Co., The 48

Ballison, Kenneth 47
Beaton & Cadwell 46
Beaton & Corbin 48
Belanger Regd., O. 47
Borden Canadian Co. 48

Canada Metal 11
Canadian Brass Co. 4
Can. Society of Domestic Sanitary & Heating Engineers 9
Canadian Tube & Iron Co. 47
Canadian Wolverine Co. 5
Chamberlain Desolvo Co. 5

Empire Manufacturing Co...Outside Ft. Cover

Galt Brass Co. .....Back Cover
Gummer, G. & W. G., Ltd. 6
Gurney Foundry Co. 47

Hamilton Stove & Heater Co. 47
Hause Mfg. Co., Chas. F. 48
Hoyt Metal Co. 46

Imperial City Heaters 43
International Malleable Iron Co. .....
Inside Back Cover

Jardine, A. B., & Co. 8

Kerr Eng. Co., Ltd. .....Inside Back Cover
Katie Foundry Co. 48

Long & Co., R. G. 48
Lord & Burnham 7

MacDougall & Co., R. 44
McIntyre & Taylor, Ltd. 46
Moline Heat 5
Morrison Brass Mfg. Co., Ltd., Jas. 39
Mueller Mfg. Co., H. 37
Murphy Victory Co., Limited 2

Port Hope Sanitary Mfg. Co. 12

Scaife, W. B., & Sons Co. 44
Steel & Radiation, Limited 41
Standard Sanitary Mfg. Co. 1

Taylor-Forbes Co., Limited 8
Trimont Manufacturing Co. 44
Toronto Hardware Mfg. Co. 46

United Brass Founders & Engineers, Ltd. 38

Warden-King, Ltd. 42
Wallaceburg Brass Co. 42
Wells Bros. of Can., Limited 3
Williams, J. H., & Co., ... 43

X Laboratories 45

There's Something about an Original that Can Never be Imitated!

IF you've ever heard Harry Lauder sing his Scotch songs you could tell an imitation with your eyes shut.

You've seen Charlie Chaplin do his stunts—do you think an imitator could fool the people?

Whether it's real diamonds or paste —whether it's pure gold or brass—an imitation is simply an imitation—**and nothing else.**

That's why the thoughtful steamfitter isn't going to fall for anybody's talk about something "just as good" as "X" Boiler Liquid. He knows that for positive results it is safer to stick to the original. An imitation of the genuine "X" may look like it — but that's all. Patents are allowed on the "X" Liquid process. Its quality **can't** be imitated. Imitations of the genuine "X" Liquid cause foaming. **"X" will prevent foaming.**

No fitter can afford to experiment with his profits. When you get a leaky or cracked boiler job you want to know that you can send any man to that job —have him finish it quickly—otherwise there's the kicking, the arguing and the time-wasting that is utterly useless from a money-making standpoint.

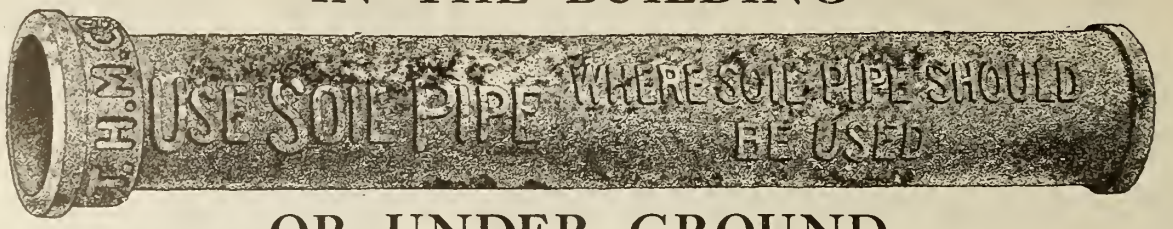
Over 25,000 steamfitters now know that "X" Liquid is the **only** scientific process for repairing leaky and cracked boilers—and for making them LEAKPROOF—RUSTPROOF — AND SCALEPROOF. They know that with "X" they make three times the profit that they could by dismantling and welding.

And they wouldn't risk their reputations experimenting with an imitation.

"X" LABORATORIES

636 Washington St. Boston, Mass., U.S.A.

IN THE BUILDING



OR UNDER GROUND

ASK YOUR JOBBER FOR T.H.M. CO. BRAND OF SOIL PIPE AND FITTINGS.

TORONTO HARDWARE MFG. COMPANY, - Toronto, Canada

WE MANUFACTURE A FULL LINE OF HIGH-GRADE RANGE BOILERS

Success

in the Good Designs

This success has been due to perfect circulation and liberal waterways, eliminating chokage.

This means durability and lots of hot water.

M. & T. coils are made of best grey iron, free from sand or blow-holes. Every coil is properly tapped with perfect standard thread, and fully guaranteed.

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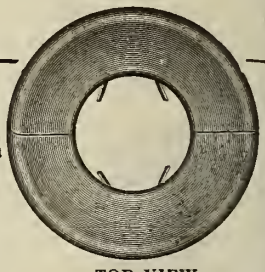
OPEN VIEW NO. 10-A

The CEILING PLATE that's better



TOP VIEW NO. 10-A

THE NO. 10—A NARROW FLANGE PLATE—IS A STEEL HINGED PLATE. FLANGES ¾" WIDE. HIGHLY FINISHED. ESPECIALLY DESIGNED FOR TWIN CONNECTION "NARROW."

Gem No. 4.

The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

High quality at the right price.

Gem No. 4 Automatic Air Valve

Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

Write for catalog showing our complete line of specialties.

The BEATON & CADWELL MANUFACTURING Co.

New Britain, Conn.

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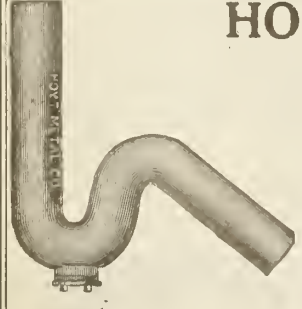
HOYT METAL GOODS ARE KNOWN

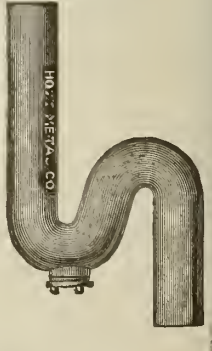
FROM COAST TO COAST



As time-savers there are none equal to our Wiping Solder, Bar or Wire Solder.

Hoyt Lead Traps, bends and waste pipe are in a class by themselves.

All our products are made to formula.



Our Mixed Metal Sales Amount To Over $5,000,000 Annually.

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New York, N. Y., London, Eng., St. Louis, Mo.

WROUGHT PIPE

BLACK and GALVANIZED SIZES, 1/8 IN. TO 4 IN.

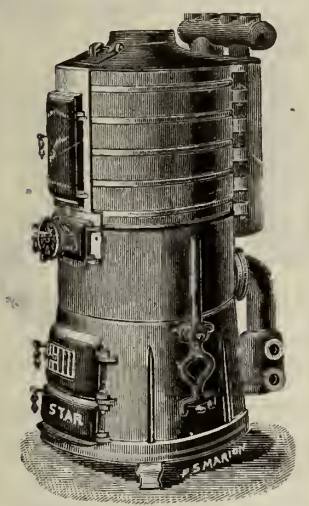
All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

All Sizes of NIPPLES (Black and Galvanized)

Ask your jobber for CT *Brand of Wrought Pipe*

CANADIAN TUBE & IRON CO., LIMITED, MONTREAL
Works: Lachine, Can.

Thousands of Star Boilers in Use requiring repair Parts



It will be a long time before folks forget the coal troubles of the last few seasons.

The principal feature of the Star Boiler is that **no other round hot water boiler has any coal-saving improvement not embodied in the "Star."**

Then, too, while boiler installation and repair time is here, why not stock up with Star parts, for which O. Belanger has taken over the rights and is now making?

Many thousands of Star Boilers are in use requiring these repair parts hitherto unobtainable.

Write to us at once in time to catch the season's business.

We guarantee prompt deliveries.

O. BELANGER, REG'D.
Amherst Street
MONTREAL

You Sell in the Dark

when you're guessing at costs. To know your costs, eliminate loss, reduce overhead expense and know where you stand—you should be enjoying "Allpriser." Why sell a fitting for 10c that costs 12c? Be up with the times; know your cost the "Allpriser" way.

Without "Allpriser"

you're struggling in a maze of "almost," "somewhere-near," "just-about" and general guesswork. Can any man compete in modern business that runs on dead reckoning? Exact navigation is needed to avoid the rocks and shoals of business to-day.

"Allpriser" is a flexible leather-bound book. 7 x 9, of 150 pages (loose leaf). It's a trade cost book especially for plumbing and heating. It includes a list with net prices of all staples. It provides a service for $25 a year that keeps price sheats revised to the latest change.

Write for subscription blank or further information.

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FOR HEATING ANY DESCRIPTION OF BUILDING BY STEAM OR HOT WATER

THE GURNEY FOUNDRY CO. LIMITED

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WE CARRY A FULL LINE OF-

BOILERS, RADIATORS, WARM AIR FURNACES & REGISTERS.

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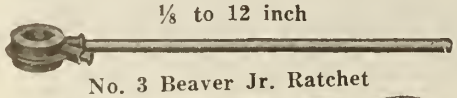
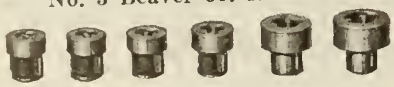
BEAVER TOOLS

For Easy Cutting

⅛ to 12 inch



No. 3 Beaver Jr. Ratchet



THE pipe-threading problem is readily solved when **Beaver Easy-Working Die Stocks** are used. They cut quicker and save labor, time and money.

They eliminate troublesome bushings and the bother of changing dies.

Beaver Threaders are easily adjusted. Simply "move the handle—that's all."

Beaver Tools are absolutely guaranteed. The user and the dealer are both protected.

Write us for descriptive circular and prices.

The Borden Canadian Company

110 Church St. - - - Toronto, Canada

GENUINE

ARMSTRONG STOCKS and DIES

Hinged Pipe Vises *Pipe Cutters*

Pipe Threading Machines

—MANUFACTURED BY—

THE ARMSTRONG MFG. Company

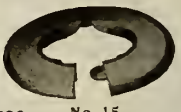
317 Knowlton Street
BRIDGEPORT, CONN

248 Canal Street
NEW YORK

"BC"

COMBINATION
COLD ROLLED STEEL
Floor and Ceiling PLATES

Carried by the leading supply houses



No. 15

Puts just the right finish on that heating job

Send for catalog of complete line of "B. & C." goods.

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Stock carried by our Canadian Representative
W. H. CUNNINGHAM & CO.
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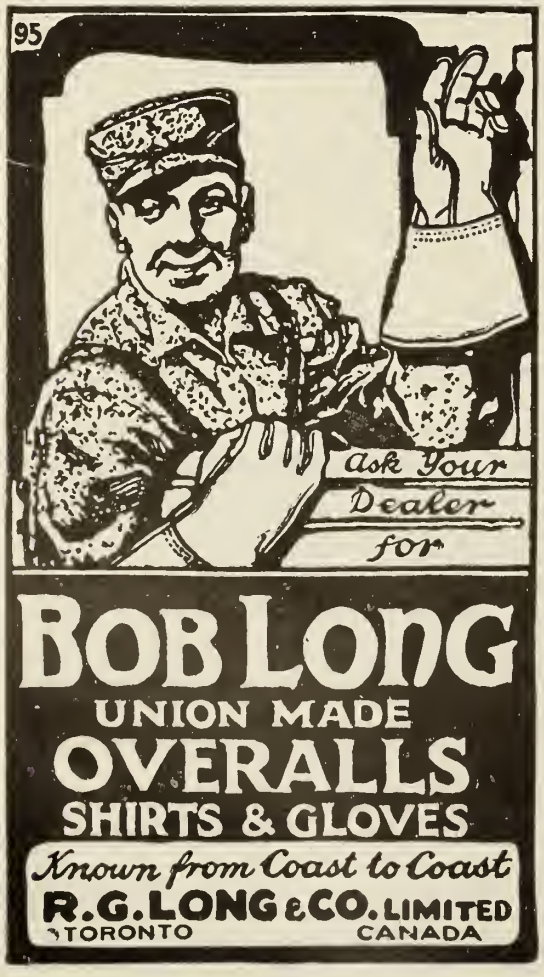
The Beaton & Corbin Mfg., Co.
Southington, Conn., U.S.A.
The Old Original Company

No. 17



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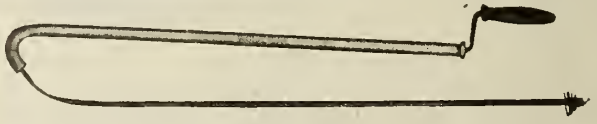
Manufacturers of the

Hause Closet Auger

Seamless brass tube—high-grade 7-16 steel spring. Made with 3-foot and 6-foot springs.



Ask your jobber or write us direct. Made in Omaha, Nebraska, U.S.A.

Canadian Distributors

Empire Mfg. Co., Ltd., London and Toronto

FOR SALE—PLUMBERS' SUPPLIES OF ALL makes, at prices that protect the plumber. American Plumbers' Supplies, 14 Craig St. West, Montreal.

Do you want help or have you something to sell, if so use the classified column in this paper.

Pipe Fittings

Made in Canada

M Brand Pipe Fittings, etc., give a service and satisfaction that will invariably get you re-orders and much new business as well.

A trial of the goods will prove this claim.

CAST IRON FITTINGS
With this brand mean fittings made with iron of high tensile strength—proper proportions and correct tappings.

RECESSED DRAINAGE FITTINGS

MALLEABLE FITTINGS
With this brand mean fittings made of Air Furnace Refined Iron, reamed and tapped to gauge with perfect threads

Standard and Extra Heavy Flanged Fittings and Flanges. Galvanizing Malleable and Gray Iron Castings of all Kinds.

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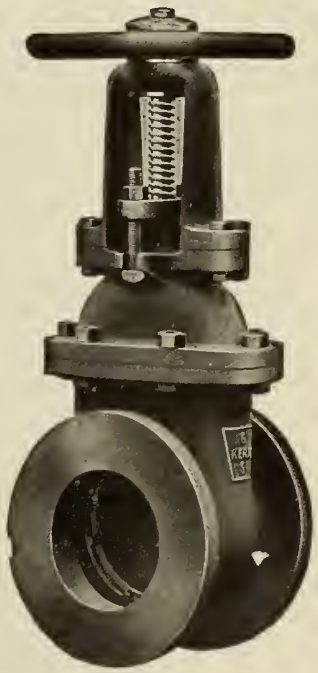
There Are Lots of Gate Valves

Advertised and Sold

but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.
Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.
Approved by the Fire Underwriters' Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

A Tank With No Lining

EVERY FITTING TESTED

EVERY TANK GUARANTEED

No Joints to Open

No Lining to Leak

Nearly Half a Million Now in Use

And not a complaint known. This success is based on a plant that is equipped for the efficient production of VitrO Tanks exclusively.

There are no joints of any kind—the tank is all one piece. The trouble is left out, producing a really No-Trouble Tank.

Galt Brass Company, Limited

Galt, Canada

Toronto Office: 67 Adelaide St. E.

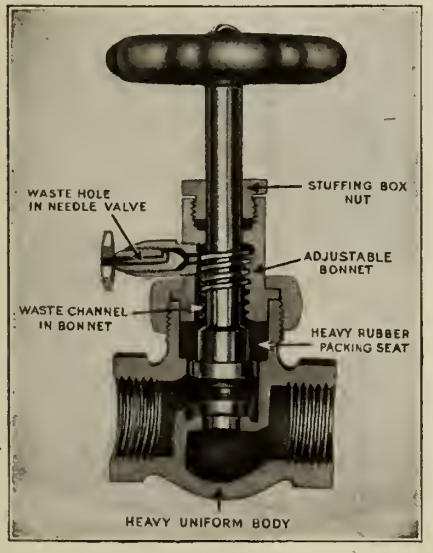
Sanitary Engineer
Plumber and Steamfitter of Canada
VOL. XIII. PUBLICATION OFFICE, TORONTO, SEPTEMBER 1, 1919 No. 16.

The New "Emco" A 332
Stop and Waste Cock

A "Two in one Fitting."

With five points of Superiority—

—five selling points in addition to the prestige that goes with the word "Emco," the trademark of its makers.



Cross Section
"Emco" A332 Stop and Waste Cock

As a straight Stop-Cock or a Stop and Waste Cock it is equally adaptable.

Study the marked points in the cross sections. Pay particular attention to the arrangements for waste water:

First—the adjustable bonnet which allows the needle waste valve to be placed in proper position for catching waste water.

Second—the needle valve which may be shut off independently to prevent a rush of water out the waste tube, when turning water on and off.

Every "Emco" is thoroughly tested before leaving our factory.

Write for our catalogues.

Order direct.

Empire Manufacturing Co., Limited
London and Toronto, Canada

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While

A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for BEAVER BRAND CAST IRON ENAMEL WARE

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Monarch Brass Mfg. Co., 71 Brown St., Toronto

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E. B. Plewes, 120 Lombard St., Winnipeg

GUARANTEE

A Little "Straight Talk" to the Canadian Plumbing Trade

Just what does this word mean TO YOU? At one time it was a sacred word, intended to convey to the suspecting public the manufacturer's "OATH," so to speak, that he had used his best endeavours to construct the article offered, strictly in accordance with his claims made in advertising it to the people, and further, the word was an assurance to the buying public of the willingness on the part of the maker to protect the purchaser from loss, if by any chance the article sold did not show the merits claimed in the advertisement.

What does the word stand for to-day? You know as well as we do, it is a camouflage, used extensively by concerns marketing inferior goods, and it is regrettable to note that where quality is least to be found, you will get in its place a whirlwind campaign featuring the guarantee, and about the time the article is spread over the territory, the specialized feature, "ITS GUARANTEE," has passed away, like many of its predecessors, or it may linger long enough to absorb some of your time and postage in a vain effort to prove that the "trouble was up to the factory." Again, it may live long enough to enter its final resting place—"undoubtedly" the courts. A lawyer (if he be honest) will admit that no word in the English language has ever been the cause of so much litigation as the much abused slogan "FULLY GUARANTEED."

It is a suggestion that the sanitary engineer fight shy of product earmarked in this way, but demand the manufacturer's "TRADE MARK" on everything he uses. This mark, to have value, must prove its worth. Therefore, if the maker is willing to stamp his approval on the product, and to stand or fall by this act, you can with safety consider the "TRADE MARK" as your insurance policy. With this in mind, we give below our respective marks of Quality, Efficiency and Service.

TRADE B.O.T. MARK

THE CANADIAN BRASS CO.

LIMITED

GALT, ONTARIO

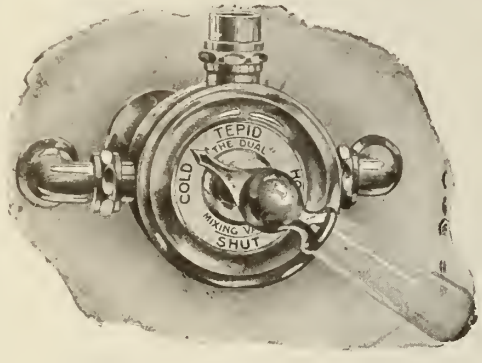
CANADIAN BRASS GALT ONT

SANITARY ENGINEER, September 1, 1919, Vol. XIII., No. 17. Published 1st and 15th of every month at 143-153 University Ave., Toronto, by The MacLean Publishing Co., Ltd. Yearly subscription price, Canada, $1.00; United States, $1.50; Great Britain and the Colonies, 4s. 6d.; elsewhere, $2.00. Entered as second-class matter at the Post Office Department, Ottawa. Entered as second-class matter July 1st, 1912, at the Post Office at Buffalo under the Act of March 3rd, 1879.

G. & W. G. GUMMER, LIMITED

EFFINGHAM BRASS WORKS,
ROTHERHAM,
ENGLAND

And at
9 Fenchurch St.,
London



"Dual" Mixer

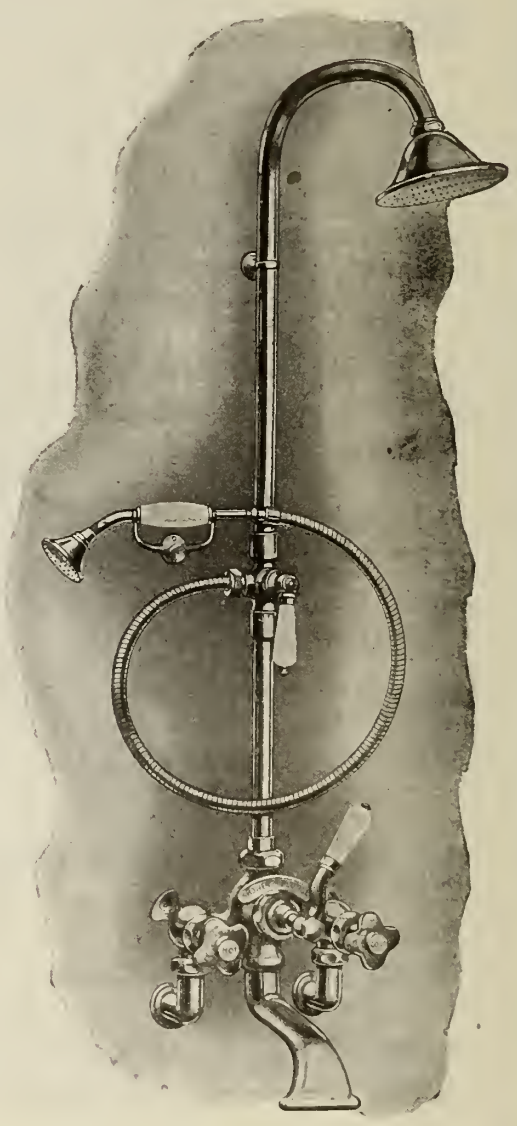
A valve that really mixes Hot and Cold Water, and maintains a uniform mixture.

For ease of operation, simple construction and easy installation, it has set a new standard of efficiency.

Cold Water must be turned on first, no possibility of scalding.

Made in several forms for Showers, Sprays, Operating Rooms, etc.

At the well-known works of Messrs. Brunner, Mond & Co. these valves provide baths for 2,500 employees.

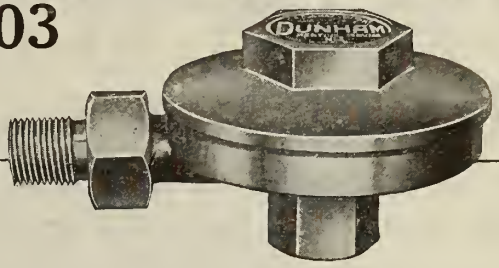


G. & W. G. GUMMER, LIMITED

Manufacturers of every description of

Engineers,' Plumbers' and Sanitary Quality Brassware

Same in principle today as in 1903



INVESTIGATE the trap question and you find two truths: that in the last fifteen years the carbon post type and the float type trap have been supplanted by the thermostatic disc type trap—and that the Dunham Radiator Trap, the **first** thermostatic disc trap, is essentially the same in principle to-day as when it was first marketed.

The Dunham Radiator Trap was designed to relieve the radiator of the entrained air and water under conditions varying from 10 pounds pressure to 15 inches of vacuum, without adjustment. It did this in 1903—it does it to-day.

Send for complete data on all the elements in Dunham Heating Service

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HALIFAX
OTTAWA
VANCOUVER

The DUNHAM HEATING SERVICE

MONTREAL
WINNIPEG
CALGARY

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Hot Water Heating by Steam

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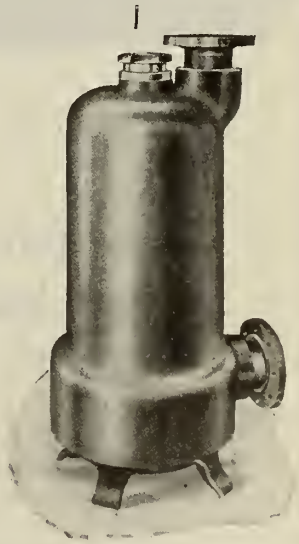

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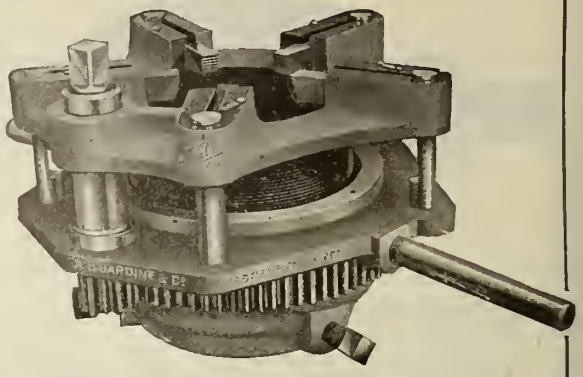
JARDINE and TOLEDO PIPE THREADING TOOLS



"Toledo" Geared Adjustable Threading Tool No. 2½. Capacity 2½ to 6 in. inclusive. Weight, 120 lbs.

THE ratchet feature of Jardine and Toledo Tools permits their being used to thread pipe which is already in place, no matter how awkward it may be to reach. The Jardine and Toledo have no cams or jim cracks to get out of order; and the dies only cut with the mouth of the cutter. Also, as the tool advances on the thread the dies open out so as to make the proper taper. This means there is no friction on the pipe and every ounce of strength is used in making the cut, so saving time and labor. These are only a few of the valuable features of these tools.

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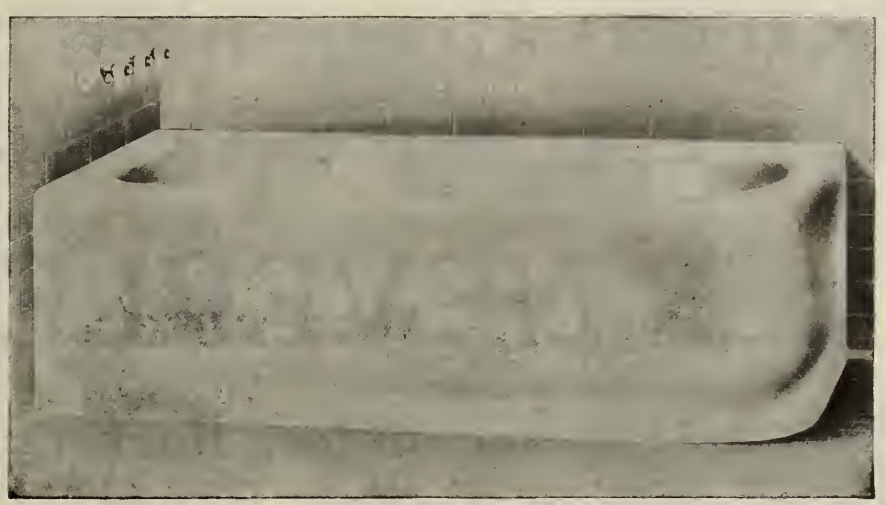

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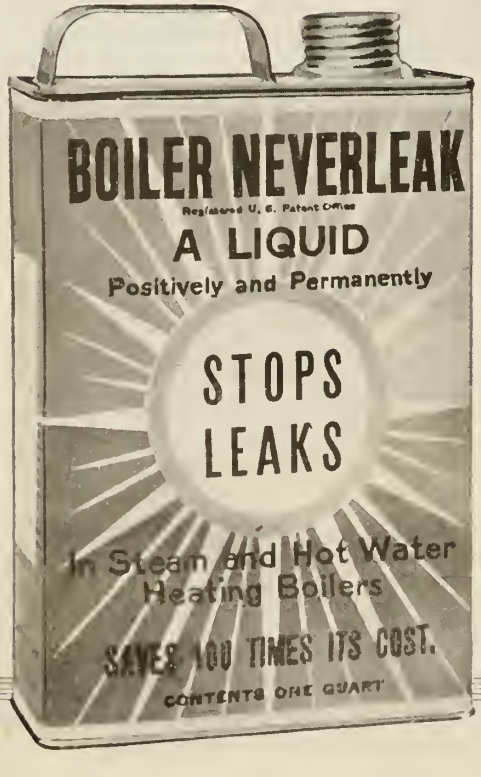

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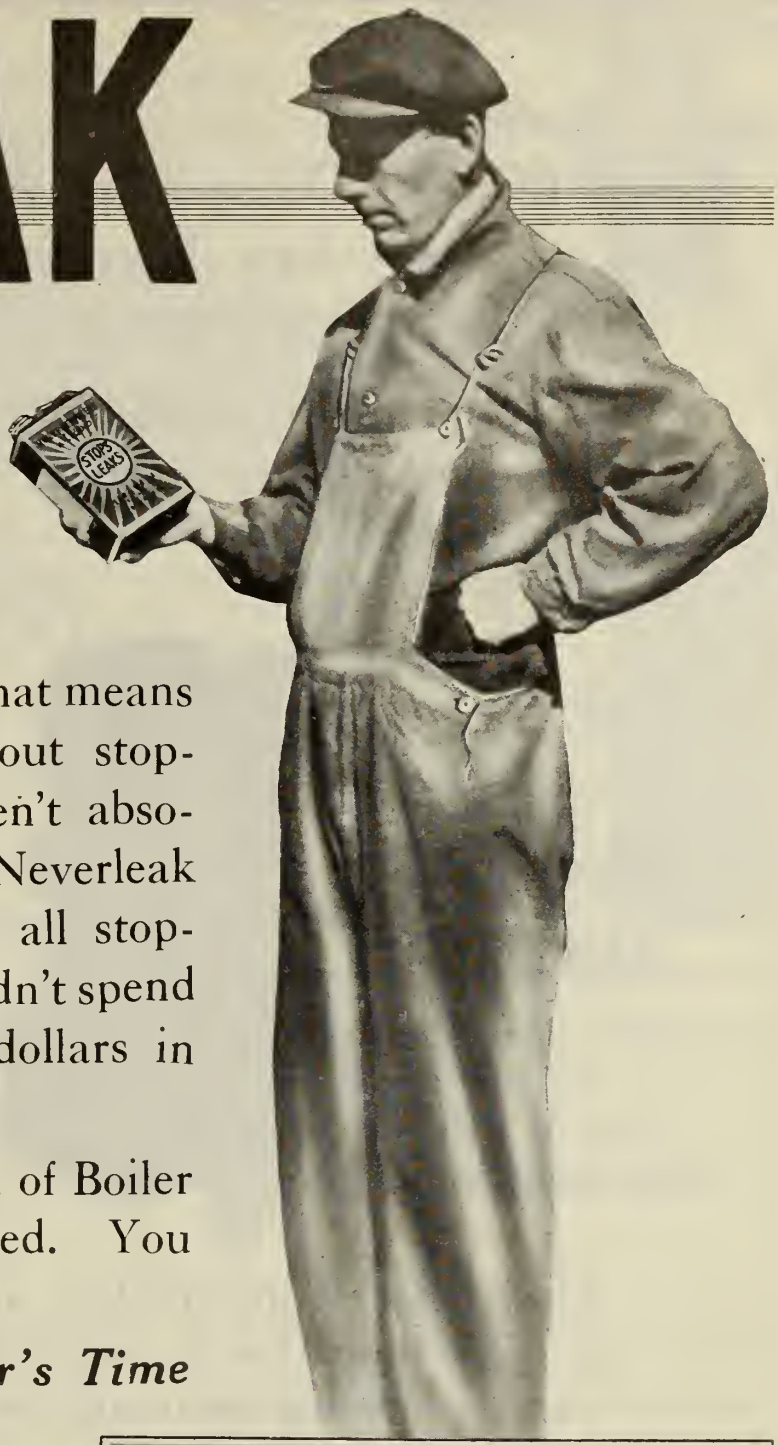

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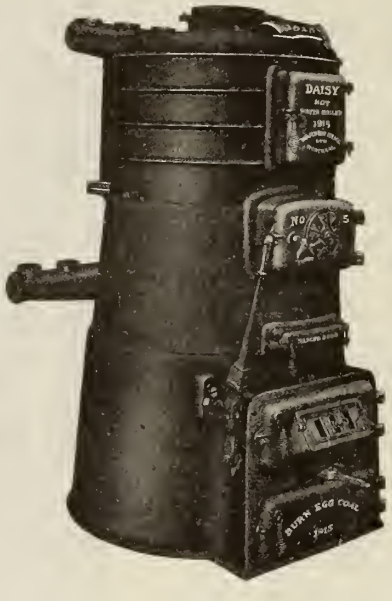

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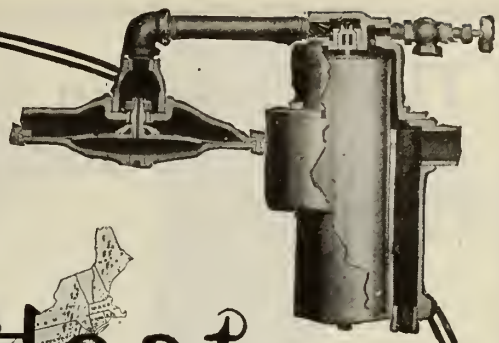

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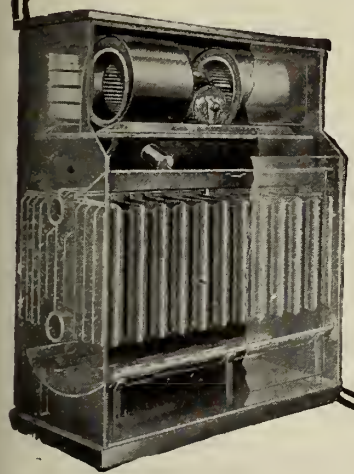

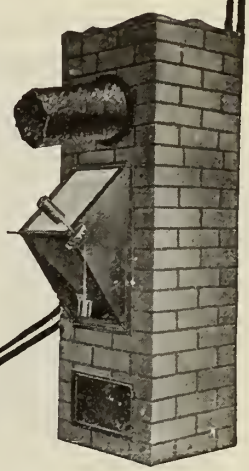

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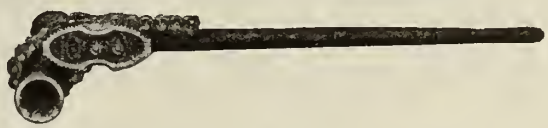

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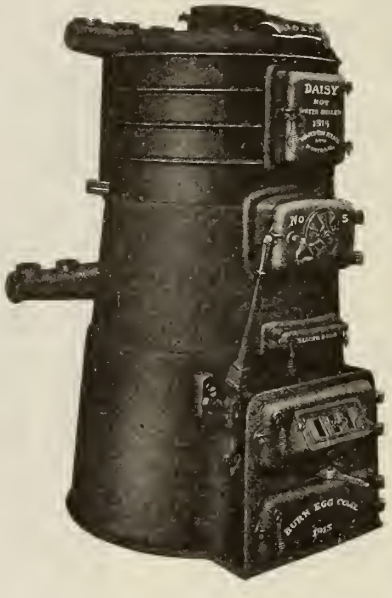

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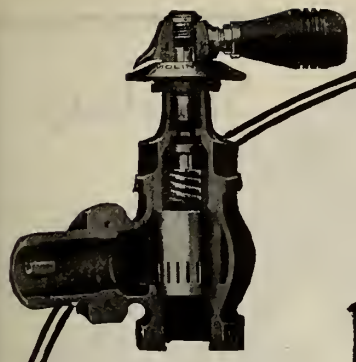

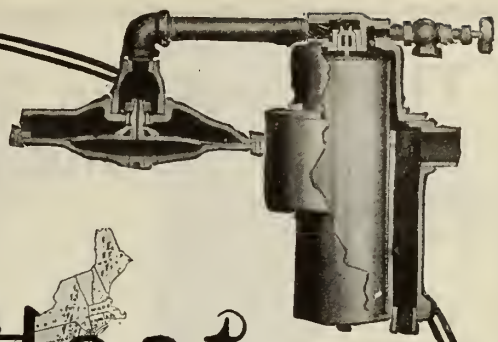

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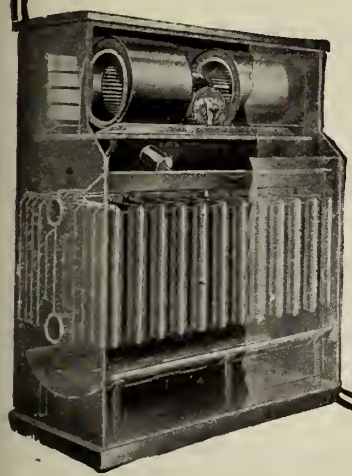

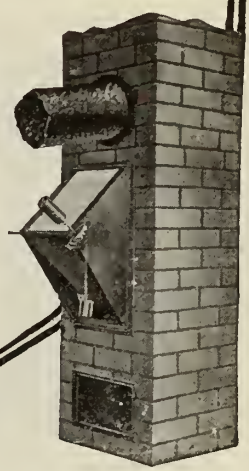

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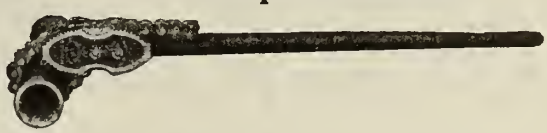

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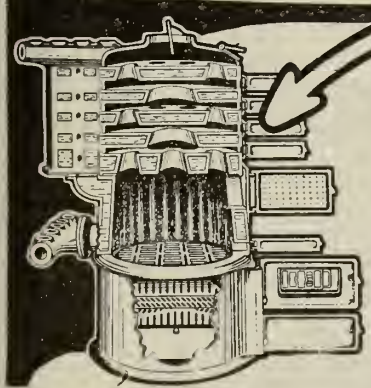

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SANITARY ENGINEER

PLUMBER AND STEAMFITTER OF CANADA

ESTABLISHED 1907 PUBLISHED TWICE MONTHLY

Vol. XIII. TORONTO, SEPTEMBER 1, 1919 No. 17

CONTENTS

Sanitary Plant of a Memorial Hall 15-16
Master Plumbers Wrestle With New By-laws 17
Montreal May Spend $3,000,000 in Homes 17
Working a Winning Combination 18-19
Retailers Strongly Supporting Move 19
Says Go After Business and You Will Get It 20
Saving Fuel in Heating a House 21-23
Editorial Comment 24-25
Rules For Computing Required Radiation 26-27
News From Here and There 28-29
Heating and Ventilating—Heat 30-31
Ventilating the Modern School 31-34
Practical Sheet Metal Work 35
Market Conditions and Tendencies 36-38

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Published on the First and Fifteenth of Each Month
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The Plumber as a Salesman

"Wanted—A Salesman For Plumbing Supplies"—read the advertisement, and among the answers received were some from Master Plumbers, some of them very fine fellows, fairly well educated and who knew the Trade thoroughly.

They wanted, to use their own words, to better themselves and they thought the position as a Salesman offered a greater opportunity for advancement.

But is such really the case. Let us assume that the applicant obtains a position with a first-class plumbing supply house or manufacturer. He is no longer a free agent, he must conform with the rules of his house and to the established customs of the great fraternity of salesmen. He is expected to show initiative in promoting new business and great energy in developing the business which should naturally result from direct inquiries. He interviews everyone who does or is likely to require plumbing material and in the hardest kind of competition secures his orders.

Does his work cease when he turns his orders in to the house? Not so. He will find a hundred and one little matters that require to be adjusted and many of them have no connections with the sale as neither he nor his house have any control over the goods after they are delivered.

Suppose he remains as he is—a Master Plumber. He has the same ability and opportunity as a salesman. If he is progressive he knows all the work that is going on or can obtain the information from the same source as either the jobber or manufacturer. He has the same number of illustrations, the same literature and he has the same initiative, but he develops it on his own account.

He has the advantage of being able to sell direct to the consumer, personally interviews his prospect, visualizes the installation, and in his most interesting way describes the modern bathroom, the complete kitchen or convenient laundry equipment, and eventually closes the contract or makes the sale.

His interest, however, does not cease at this point. He is complete master of the situation, buys the material he specifies, has it installed under his supervision by clean and careful workmen, with the result that he is able to guarantee an absolutely perfect job which will be satisfactory to his customer and a future reference for himself.

Such a man is a salesman in every sense of the word. In addition to selling the goods, he sells service and in that line there is very little competition and price is not a factor in the transaction.

Our company's interest is, of course, in having its products properly installed. Plumbers tell us that they like our fixtures, that they have a nice clear color, are easy to clean, properly packed and convenient to install; but we know that no matter how good our ware is it is more attractive and becomes a better advertisement when it is properly installed by a good mechanic under the careful supervision of a Master Plumber who takes an interest in his work.

Just think what it would mean if every Master Plumber in Canada, and there are about twenty-five hundred, was a well-trained salesman and directed his energy and ability to sell plumbing material under the conditions we have set forth. The volume of business would increase and the conditions under which the work was done would be more profitable to the plumber and more satisfactory to the manufacturer and the consumer.

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Established 1907 Circulates Throughout Canada

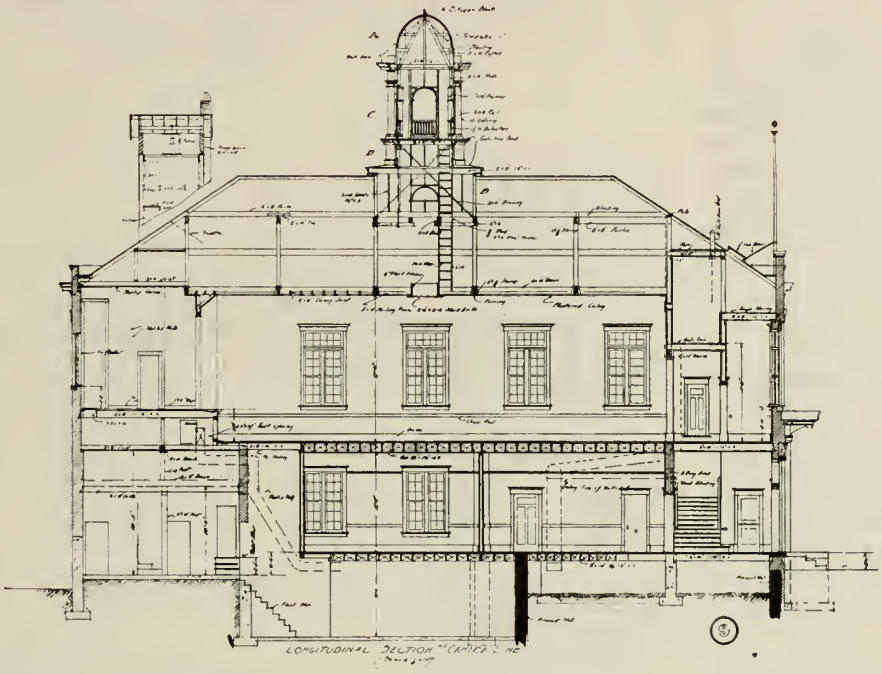
Sanitary Engineer
Plumber and Steamfitter of Canada

Published First and Fifteenth of Month

Vol. XIII. TORONTO, SEPTEMBER 1, 1919 No. 17

Sanitary Plant of a Memorial Hall

Details Showing Work Entailed in Installing Modern Plumbing in Town Where No Waterworks Exist—Lakefield, Ont., Tackles Job



Incorporated in the Design is a System of Sewage Disposal and a System Supplying Fresh Water—Plans Reproduced Show Details

THE village of Lakefield, Ont., where the hall is being erected, has no public sewers nor a domestic water supply, and therefore it became necessary when specifying a modern plumbing system for the building to incorporate in the design a system of sewage disposal and a system supplying fresh water.

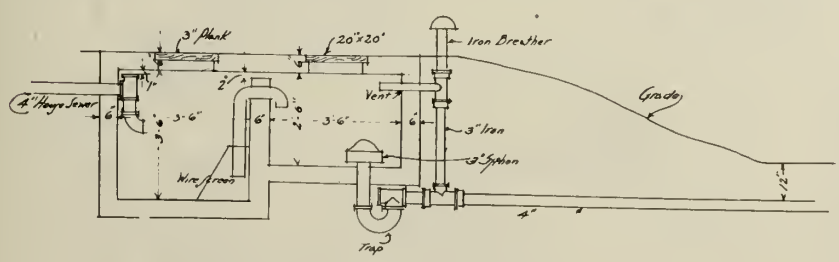
The site of the building is the corner of a park; the ground falling to the north with a gradient sufficient to allow for the installation of a septic tank, but not quite enough for the provision of a sludge removing chamber. The ground is a sandy loam and is of a nature that allows for almost ideal working conditions for the system of sewage disposal specified.

Will Drive a Well

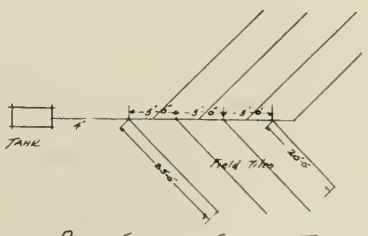
A well fifteen feet deep is to be driven close to the building—at a higher level than the sewage disposal field. Water will be drawn from the well by a 500-gallon per hour pump operated by a ¾ H.P. self-starting electric motor. The pump is to be connected to a 520-gallon storage tank and the tank is to be connected to the fixtures by means of a supply pipe run just as with a city service pressure.

The rain water pipes are not connected with the sewage system. They drain to a dry well set just below the frost level.

Referring to the plan it may seem to the reader that the septic tank is rather small for



CROSS SECTION OF SEPTIC TANK



PLAN SHOWING SEPTIC TANK & FIELD

Note: This does not indicate location

the number of fixtures shown, but the consideration of how often these fixtures will be used should show why a tank of the ordinary residence size was specified. If the tank is too large, the sewage remains in it longer than required for the best working of the bacterial action.

The septic tank will have overall dimensions of 9 ft. x 4 ft. 6 in. It will be constructed of concrete with 6 in. walls as shown in the section.

Empties Into Tank

The house sewer empties into the tank as shown and it will be noted that there is a tree with an open end placed at this junction, where the air driven ahead of the sewage may escape above the mat lying on the surface of the water in the tank.

Would Need a Box

If this vent was omitted it would be necessary to place a 12 in. box around the house sewer outlet to prevent the rush of sewage breaking up the mat. A wire screen is placed around the mouth of the overflow pipe to prevent solids from the sludge bed finding their way into the closing chamber.

After the effluent has passed into the closing chamber it is syphoned into the aeration field at intervals governed by the time taken to fill the closing chamber to a point necessary for the action of syphonage. The depth of the trap or the syphon is not drawn to scale.

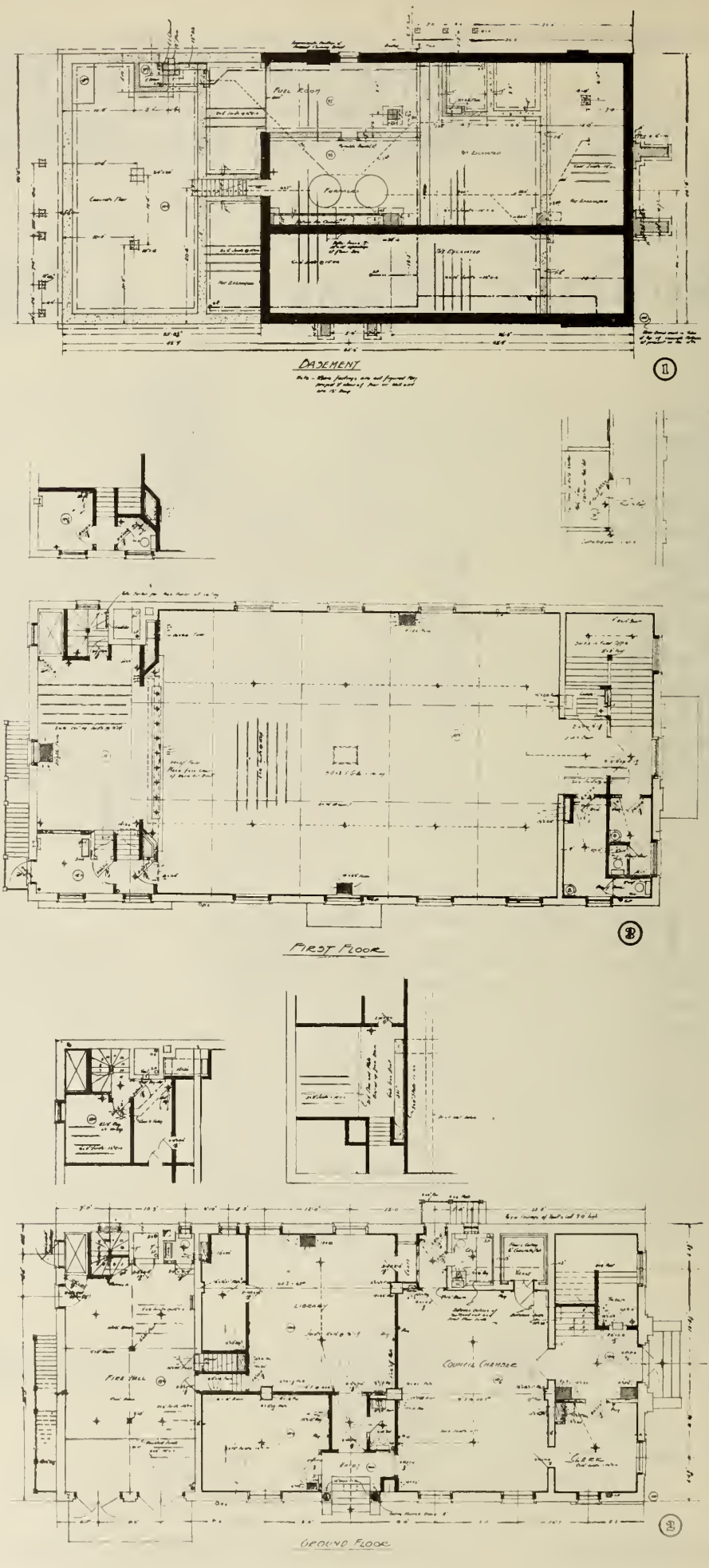
There are 4 in. medium cast iron soil pipes shown in the drawings with all of the necessary brass screw cap cleanouts where bends occur in pipes.

All fixtures will be vented to 3 in. main vent stacks run beside the main soil pipes.

The wash basins will be supplied with compression bubbling faucets so that they may be used as drinking fountains.

The W.C. seats are to be fitted with ball weights, so that the seats will always be thrown back of the bowls, except when they are in use. All seats will have open fronts.

Every closet in the building will have outside light and air.



Plumbers Wrestle With New By-Laws

Committee Has Had Many Sessions to Consider New Laws to be Adopted by Montreal City—Care Necessary That Best Working Measures May be Adopted

THE committee of Montreal Master Plumbers who has had under advisement the proposed plumbing by-laws of the city, has been working hard of late to perform the task. It will be recalled that the Administrative Commission of the city recently requested the co-operation of the craft in this respect. This is a tribute to the importance of the functions performed by the Master Plumbers, and the efforts being carried out under the chairmanship of P. C. Ogilvie will doubtless greatly add to the effectiveness of the measures proposed. True, it means a lot of work for these men, but it is in the interests of the craft and in that of the public that the committee is laboring.

General Meeting Held

Of course, the committee has been working for some time at this task. The time was thought opportune to acquaint the masters, generally, of the progress made, and of the characer of the proposals. In accordance with this, a meeting was called and held in the Montreal Builders' Exchange on the evening of the 21st inst. This was well attended, and while the discussion did not bring the desired results, interest in the new by-laws has been stimulated.

There were nearly forty members and non-members present at this meeting and David K. Trotter, secretary of the Builders' Exchange, briefly outlined the object for which the meeting had been called and suggested the appointment of a French-Canadian and an English-speaking chairman. This was approved and Telesphore Latourelle, Montreal, president of the Association of Master Plumbers, was selected to address the meeting in French, while D. A. Bethune was the English-speaking appointee.

Committee Reports

The committee is comprised of P. C. Ogilvie, Walter Ryan and Alex. Charette. As chairman, Mr. Ogilvie reported progress, indicating that the committee had considered, clause by clause, about one hundred of the proposed sections, this being, approximately, half of them.

Appreciation of the tedious effort required to minutely and carefully consider by-laws which are to be the guide of hundreds of plumbers is not always given. As an indication of what this means Mr. Ogilvie stated that eight meetings have already been held and these were of from two to three hours' duration each. He also stated that in their considerations they had remembered the duty which is owed the public generally. These laws must be so framed as to conserve and guard the public health. With this in view, the type of master plumbers should be high and this could be secured, in part at least, through the adoption of, and adherence to, a rigid examination test to be embodied in the requirements of the city by-laws. Examinations to be passed should be more exacting. Fees, perhaps, should be greater than they now are.

Some discussion arose as to the consideration of the various clauses. If this were continued, it would take a long time and it was finally decided to postpone the further consideration of the clauses for a week.

Awakening Interest

After interesting and more or less extended observations by the joint chairmen as to the qualifications of master plumbers, and what these qualifications should be, the meeting took a decidedly different, though an interesting turn. The fact that many of those present were not members of the local association was introduced, and the advantages of belonging, officially, to such a body were voiced by J. E. Walsh. Mr. Walsh referred to the particularly good and interested material that had been secured within the past year or two. President Latourelle and Mr. George Delaney were two of the youngest members, in point of actual contact with association affairs in Montreal, and yet they were among the most enthusiastic. It was, Mr. Walsh thought, one of the best arguments anyone could advance as to the advantages of belonging to the Master Plumbers' Association.

Interest was quite manifest and it will not be surprising if the Montreal section is twice as large, ere long, as it is at present. The extent of development which any association can look for will depend, largely, upon the zeal with which members tackle their work. New blood will be welcomed in the Montreal Association, and the membership fee of $5 will debar none, surely.

Further discussion will be taken up on these matters, and also regarding wage and labor conditions, on August 28th.

Montreal May Spend $3,000,000 on Homes for Workingmen

Houses to Cost $3,000 Each Are Planned and if Arrangements Are Carried Out Construction Work Will Commence in the Spring

HOUSES for the working man, which would cost about $3,000 and rent for 10 per cent. of that cost, per year, is the tentative proposal of Dr. Emile Nadeau, housing director for the Province of Quebec, outlined at a representative gathering of the members of the Builders' Exchange, in Montreal. Dr Nadeau outlined briefly a plan for the erection of 100 houses in the city of Montreal, the details, at a rough estimate being $300 for the lot, $300 for local improvements, and $2,400 for the building, or $3,000 in all. The life of such a class of buildings as Dr. Nadeau had in mind, would, he said, be 60 years.

Spend $3,000,000

Montreal, Dr. Nadeau, pointed out, would have about $3,000,000 to expend in housing, under the federal grant for that purpose, and it was his idea, that three building societies ought to be formed, which would handle $1,000,000 each of that fund, such organizations to be operated on purely philanthropic lines, as the returns were not to be more than six per cent. Plans, specifications, supervision and all the overhead would be undertaken by the society at an additional cost of two and half per cent., said Dr. Nadeau, and this, he explained, could be done for such a comparatively low figure by reason of the fact that the plans would be uniform for the entire Province, and that expert advice would be easily available from members of the organization.

Become Shareholders

Persons desiring to take advantage of this proposition would be obliged to become shareholders in the society to the extent of at least one share, thus every tenant would be a shareholder, and would eventually become the owner of his property. If, after 10 years, he desired to vacate the property, he could only dispose of it to the society, and would not be permitted to make an individual profit on his transaction.

Mr. William Rutherford inquired when the plans would be ready and Dr. Nadeau said that they would not be completed until the fall, that during the winter, if the project was to be carried out, preliminary town planning work would be done, and by May next the entire proposition would be in shape for building operations. Dr. Nadeau stated that a number of influential men in Quebec, Hull and Sherbrooke were ready to take hold of the idea.

Working a Winning Combination

Hardware, Plumbing and Electrical Fixtures Bring Steady Business and Good Profits to Davison & McInnis of Woodstock, Ont., the Year Round — Splendid Results Obtained From Window Displays and Advertising

Based on an interview by C. E. PARSONS, of Sanitary Engineer, with G. A. Davison and A. L. McInnis, of Davison & McInnis, of Woodstock, Ont.

"WE were forced into the business. People came in asking for things and we had to get the stock. Now we have got more business at times than we can handle."

This was the statement made by A. L. McInnis, of Davison & McInnis, of Woodstock, Ont., to SANITARY ENGINEER in reference to the firm's trade in electrical fixtures and supplies.

"Business has been better than ever," he said, "since we are allowed to do wiring again. We soon found when we went into the electrical business that we had to carry the stock in order to get the results we wanted and make money. Our constant aim in all our business is to stock good goods and back them up by good service."

Are Kept Busy

Within a radius of ten miles around Woodstock are a number of milk factories. From these as well as from the homes of the prosperous farmers all over that section Davison & McInnis get a lot of work. "We keep six men going ten hours a day the year round," said Mr. McInnis. "We never have any slack time. Last fall things got so busy that for six weeks we closed our order book and refused to take on any more work."

The firm has two good-sized display windows and these are devoted to showing seasonable lines. They are changed each week.

Have Got Results

"I cannot speak too highly of the results we get from our window displays," said Mr. McInnis. "A single instance that occurred recently is typical. We had planned a special sale and fixed up a window display and put in cards announcing the special. We intended to advertise it, but we never got a chance. The stuff was no sooner in the window than it commenced to move and we cleaned out every piece in a short time. As far as our advertising is concerned, however, we do quite a lot and have always had splendid results. We find it a very effective way to reach the buying public, not only in the city, but in the homes all through the countryside.

Keep Them Displayed

Davison & McInnis keep their store and their windows in spotless condition. The electrical fixtures are placed right up in the front of the store and on one side, just behind the show window, is a display of globes and other supplies. On the same side and right near the front stands a handsome silent salesman filled with electric flashlights. Mr. McInnis says it has sold a lot of goods and that his sales in this line are growing steadily. The left side of the store at the front is devoted to a display of enamelware which makes a fine showing on specially arranged shelves.

Keep Them Displayed

Out on the floor seasonable lines are kept on display, including such goods as electric stoves, electric washers, etc.

"We have been handling electric ranges for two years," said Mr. McInnis, "and in that time we have sold seventeen. This business grows automatically once it gets started. One satisfied customer sends another. We find that this business is developing itself nicely and prospects are good for a steady trade."

The firm some time ago commenced the repair of electrical goods of all kinds and its business in this department has grown to such an extent that now one man is kept doing nothing else.

Out on the Floor

It has been found that handling one line of goods helps the sale of another. For instance perhaps a man who is build-

Interior view of the Davison & McInnis store at Woodstock, Ont. This firm believes in getting goods out where the people can see them, as they find this a material aid in getting "turnover," the goal of good merchandising.

ing a new house comes in to see about the plumbing and selects the bathroom equipment, the heating and other equipment. While he is in the store he can see a fine display of electrical fixtures and every effort is made to interest him in this line, not only for the lighting for the bathroom, but for the whole house. If his wife is along there are electric irons, electric washers and other lines in which she is interested and many sales are made in this way.

Sell Many Ranges

Gas ranges are a big seller with Davison & McInnis.

"We have sold over 200 in two years," said Mr. McInnis.

He stated that in the farm homes around Woodstock there is a noticeable tendency towards improvement and that the farmers are good buyers and want the best and are willing to pay for it.

In connection with the plumbing end of the business the firm works along the line of replacing parts that are giving trouble with new goods instead of trying to repair the old.

"We have found," said Mr. McInnis, "that in most cases it is bad business to try and fix up something that is not worth fixing. It only gives trouble again, perhaps the next day and then the owner is dissatisfied. I generally advise owners to put in a new part and find that they are willing to do this when it is explained to them why it should be done and that better results will be obtained."

Should Be Remedied

Mr. McInnis brought up a point in connection with the manufacturers that is causing a good deal of discussion among various firms.

"If a manufacturers sells us an article that is supposed to be tested and guaranteed and it proves defective," he said, "why should we have to stand the expense? Take thirty-gallon range boilers, for instance. I have taken out more than twenty. All were supposed to have been thoroughly tested. Each defective boiler cost me over $3 to change. I think that there ought to be some protection for the dealer and that the trade ought to take this matter up. Some action should be taken to protect firms like ourselves."

In Close Touch

In its hardware, plumbing and electrical business the firm keeps in very close touch with the contractors. In this way contracts are very often obtained which practically cover a house or new factory in all lines which Davison & McInnis are prepared to figure on. By getting large orders of this kind for builders' hardware, electrical fixtures, paints, plumbing and heating and other goods they reduce their selling costs to a minimum and increase their profits automatically. This is one of the advantages to be derived from carrying on a general business of this kind, as all profits on each line are secured by the one firm. As far as Davison & McInnis are concerned they are very, very well satisfied with the merchandising end of their business and with the results that have been obtained from the combination of hardware, plumbing and electrical goods.

The store front of the Davison & McInnis store in Woodstock, Ont. Good use is made of the windows, and a very good showing of electrical fixtures is seen suspended from the ceiling of the window to the left.

Retailers Strongly Supporting Move to Eliminate Unfair Advertising

Merchants Are Much More Alert Than Manufacturers and Jobbers, Says Bulletin Issued by the Associated Advertising Clubs of the World

SOME manufacturers who so often complain that the retailer is behind times in movements for the improvement of business methods may be greatly surprised, says a bulletin from the Associated Advertising Clubs of the World, to learn that retailers are, on the average, very much more alert than manufacturers and jobbers in their interest in the elimination of unfair advertising and other unfair practices in selling, such as are dealt with by the National Vigilance Committee of the Associated Advertising Clubs, and by the local Vigilance Committees of advertising clubs affiliated with the A.A.C. of W.

Support the Movement

"Perhaps there could be no better indication of the interest of local advertisers," says a bulletin from the Associated Advertising Clubs, "than the way the retailers contribute toward the support of the truth in advertising movement. Some local stores contribute $1,000 or more a year toward local better business bureau work, and a large number are paying more than $250 a year. One store pays $1,300, and says it is getting its money's worth.

"When the Better Business Commission of Toledo was recently organized," continues the bulletin, "there were eleven subscriptions of $300 each from local business men, while the local Chamber of Commerce signed up at $1,000 a year. In Cleveland, Indianapolis, Detroit, and in numerous other cities, payments of $250 a year and more are not unusual.

"These figures are cited," says the bulletin, "to show that the local retailer is very much interested in better advertising, and that he proposes to see the movement go forward. In the meantime, some of these stores which are investing considerable sums in local vigilance work are paying considerable sums toward the general work of the Associated Advertising Clubs of the World. One store which pays more than $1,000 locally is paying $200 a year as a member of the general movement, another which pays $300 locally pays $100 to the general cause, etc.

"While the retailers may be slow in some things, they have not been slow at all in their support of the movement for truthful advertising and for the elimination of unfair selling competition."

THREE-DAY OUTING

A three day picnic that took the form of an auto trip from Port Arthur and Fort William to Duluth and back, was enjoyed by several of the plumbers of Port Arthur and Fort William and their wives. Those who took in the trip were: Mr. and Mrs. L. A. Greene, Mr. and Mrs. W. B. Sime, Mr. and Mrs. H. R. Sime, Mr. and Mrs. S. Oakley, Mr. and Mrs. F. J. Green, Mr. and Mrs. R. A. Shaw, Miss Mae Hubman, Miss Gibson and Mrs. J. Montgomery.

Says Go After Business Aggressively and You Will Get It

Donald Sinclair, Paris, Ont., Sanitary Engineer, Sees Splendid Opportunities in the Activity Now Going On All Over Canada For Selling More and Better Goods— He Keeps in Close Touch With the Farmers

DONALD SINCLAIR, of Paris, Ont., has been doing a steady business in the installation of pneumatic water systems, heating systems, bathroom equipment, and other plumbing lines. Now that construction work is being resumed on a normal scale and a lot of much needed home building is going forward, he looks for business to expand steadily. Each year also sees more and more farmers putting modern improvements in their homes. Mr. Sinclair in a salesman and neglects no opportunity when out on a job to size up all the needs of the customer, and then gets busy with practical suggestions which often leads to sales.

Helps Get Business

There is a great deal to be done in this way, he says, and a lot of business to be rounded up that can be reached in no other way. He finds that people appreciate his suggestions as service from a man who knows his business and is advising them, not because he has something he wants to sell them, but because he has goods which will make their homes better, and more comfortable, and will pay many times over in service the money expended.

Seizes Opportunity

Making the most of opportunities by taking advantage of them quickly has helped Mr. Sinclair to keep pace with the demands of the people throughout the countryside. There are many prosperous farmers in the district and many of them have been adopting modern improvements. Mr. Sinclair soon let them know that they could get electric fixtures at his store, and also that he handled bathroom fixtures, electric lamps and electric washers.

Gradual Development

While there has been no big rush in these lines, but rather a gradual development, as one satisfied party told another of the benefits of the new lines, it has been a steady growth that has meant a lot of nice business for Mr. Sinclair. He has had to meet mail order competition in these goods and others, but he says he can do it every time and without any trouble. In selling electric washers he nearly always works on the plan of letting any woman who shows that she is really interested take a machine home and try it.

"Once the women get them home," said Mr. Sinclair, "and see just how much time and drudgery a machine will save them, they don't want to part with the machine, and it is rarely that one ever comes back."

Favors Cash Trade

While Mr. Sinclair favors doing business on a cash basis, he says it is not always possible to do this under conditions as they exist in this vicinity. He has strong sentiments regarding the matter, however.

"In my opinion," he said, "credit business is a curse of the country. Everybody knows you and tries to take advantage of you because they know you. I think the Government ought to enact legislation which will prohibit the credit business. There are endless small accounts and these eat themselves up in no time in efforts to collect them."

Lets People Know

Mr. Sinclair has found that it pays and pays well to have display windows, to keep his goods out in the shop where people can see them and to advertise regularly

"Don't be afraid to let people see your stock," said Mr. Sinclair. "Goods that are kept hidden away under the counters, in drawers or down the cellar will not turn over nearly as fast as those that are displayed in your store so everyone that comes in will see them"

Do Good Work

Another foundation principle is that all work that is done must be of the best. Mr. Sinclair wants no dissatisfied customers either from his hardware store or his plumbing department. With an eye to building for the future, he has always worked along this line, and he says it is the only plan to follow. He has found from experience that no merchant can have a better advertisement than satisfied customers. No matter what they buy from you, if they are satisfied they will talk about your store and your goods and your service to your friends. Mr. Sinclair can trace a lot of business to good words spoken about him by those whom he has pleased. Not only that, he says, but they always come back when they want anything else.

Don't Forget Your Overhead

Impossible to Get Best Results Unless Business is Conducted on A Business-Like Plan—Too Many Firms in the Past Have Been Neglecting to Take All Items Into Account When Figuring

IN ALL lines of business efficiency in management as a result of general conditions is becoming more vital to success than ever before. Those who have been studying how they can get the best results have had it unmistakably borne in upon then that the whole problem centres around overhead. The time is coming, and very rapidly, when the dealer who has not a sound knowledge of overhead is going to be so handicapped by following old methods that he will be forced to adopt business methods or quit.

It is not always realized that the smaller shops doing a general business have a great influence on prices, and as overhead is one of the great factors in determining price, it may be readily seen that the greatest good to the greatest number may be accomplished when a comprehensive knowledge of overhead becomes established in the minds of those in the trade. Once a plumber gets it into his head why and how his prices have been too low, and how to arrive at the correct price it is inevitable that betterment will follow.

For the great mass of shops it would be an impossibility to maintain a department for dividing overhead into its integral parts. This, however, is unnecessary. Each man may arrive at the percentage it costs him to carry on business for himself. The great trouble seems to be that many of those in the trade do not always include all the items that should be included, and as a result are making the public a present of whatever charges are left out by figuring too low. Overhead means the expense of carrying on business, and includes the money paid for rent, insurance (fire, liability, accident, compensation, etc.), taxes (water, city, country), advertising, printing, stationery and postage, telephone and telegraph, trade and daily papers, mercantile reports, legal expense (attorney fees, etc.), collections, dues to trade organizations, etc., charities and donations, shop supplies for which no charge is made, lost time of workmen (time paid for but not chargeable to any job), bad debts allowance (reduction made to get settlement of account), depreciation (on tools and equipment), freight (where not added to cost of material), car fare (when not charged to job), light (gas, electricity, etc.), power (gas, electricity, etc.), (steam), heat (gas, coal, etc.), hauling (where wagon or truck is owned by establishment this would include all cost of operation, such as drivers' wages, feed, repairs, etc.), salaries (money paid to those for whose services no charge is made, viz., bookkeepers, errand boys; where the latter do not work on jobs, money they receive should go in this item).

Saving Fuel in Heating a House

By L. P. BRECKENRIDGE and S. B. FLAGG

The total output of coal in the world during the calendar year 1913, according to a Government report,* was 1,443,393,052 short tons, and of this enormous amount 39.5 per cent., or 570,048,125 tons, was mined in the United States. Probably 10 to 15 per cent. of the coal produced in this country went to purchasers who used it largely for heating dwellings. The Federal Government uses a large quantity of coal for heating the many small buildings occupied by its various departments and bureaus, and is therefore directly interested not only in selecting proper fuels, but in obtaining the best possible results from their consumption. Because of this interest on its own account and the widespread interest of householders the Government some years ago conducted tests to determine the relative value, for use in residence-heating boilers, of several typical fuels.†

The value a householder gets from the fuel he burns depends largely on the character of the heating apparatus, the conditions under which it is installed, and the manner in which the fire is handled. The authors, from experience in firing residence-heating apparatus and from observing the methods employed by many who attend to such apparatus, keenly appreciate the importance of proper firing methods, and have written this paper in the belief that some general remarks on the selection, care and operation of residence-heating apparatus may prove of value to many who are interested in burning fuel in the most economical manner.

This is the second instalment of the fourth of the series of Engineering Bulletins issued by the United States Fuel Administration in collaboration with the Bureau of Mines, Department of the Interior. This series is receiving very favorable comment. In the concluding instalment on "Saving Fuel in Heating a House," "General Suggestions on the Firing of Coal, etc., will be dealt with. This fourth article covers the saving of fuel in house heating thoroughly and should appeal to every heating engineer. There will be three instalments. Keep them all for reference.—EDITOR'S NOTE.

Factors Governing Consumption of Fuel and Convenience of Operation

Climate

Some factors that greatly affect the total consumption of fuel are not at all related to fuel economy; one of these is climate. It is obvious that in northern Maine much more coal or wood will be needed to heat a house of a certain size to a certain temperature on a January day than will be needed in southern Georgia. In this instance the difference of outdoor temperature is great, but a smaller difference will have an effect. Variable weather always makes difficult the economical use of fuel; high winds likewise are unfavorable because of the volume of cold air that enters a house. Convenience of operation will also be affected by climatic conditions, being favored by even but not too low temperatures and by lack of high winds.

Size and Type of Dwelling

Other things being equal, fuel consumption will, of course, vary with the size of the house and the number of rooms heated. Nevertheless many people do not give this point due consideration when comparing coal bills for a year, and do not take into account differing requirements of temperature and duration of heating.

In addition, satisfactory heating and the quantity of fuel required will depend largely on the construction of the house. As a rule, a stone or brick house will be more easily and economically heated than a frame house, although substantial and thorough construction are of greater importance than the building material. Ill-fitting doors and window frames or sashes, especially in a house exposed to high winds, may make economical heating impossible with any boiler or furnace. Double or storm windows and weather strips will materially lessen the quantity of fuel consumed and the amount of attention required by the heating apparatus.

Even the distribution of radiators affects the cost of heating, for where they are not well distributed it is necessary to maintain them at too high a temperature in order to warm the cool corners of a room.

Location of Dwelling

The location of a house with reference to exposure to winds is a large factor in determining the difficulty of warming it. Between a 10-room house standing alone on a bare hill and a house of like size and excellence of construction, but the middle one of a closely-built row standing in a hollow, there will be a marked difference in heating cost.

Heating and Ventilating System Used

Convenience of operation of any house-heating apparatus is largely dependent on the system of heating and ventilation employed. The cost of heating will also depend, but to a less degree, on the type of equipment. Fuel economy and convenience are against a separate fire in each room unless the house is small or only part of it is to be warmed, except in those localities where natural gas is available at low rates or the duration of cold weather is brief.

In most houses there is no positive system of ventilation; in fact, except in sleeping rooms during the night, little or no provision is made for the admission of fresh air. Nearly all houses warmed by hot-air furnaces have ducts to take from outdoors the air to be heated and delivered to the different rooms. In dwellings heated by an indirect system, whether steam or hot water, the heating coils are in ducts through which the outside air enters. In comparatively few homes is any special provision made for removing the foul air, leakage from windows and doors being the usual reliance, particularly in a house heated by a hot-air furnace. If an indirect steam or hot-water system is installed, means of removing foul air are more frequently provided, either by vent stacks leading into the attic or through the roof, with register openings in different rooms, or by open grates, the flues for which can be equipped with dampers to regulate the removal of foul air. The system sometimes fails to work satisfactorily if provision is not made for the escape of foul air from a room, as the fresh warm air will not continue to flow in unless an equal amount escapes.

As already stated, the first cost of heating by the hot-

air furnace is less than that of either the steam or the hot-water system, but to maintain equal temperature conditions may require the burning of more fuel, whether the furnace heats air taken from outdoors or reheats air already in the house. Evidently, reheating air will require less fuel, and consequently less attention to the furnace, than heating fresh air, but the ventilation will not be good.

Some furnaces have the cold-air duct so arranged that some of the air may be taken from outdoors and the rest from inside the house, the proportion of fresh air being regulated by dampers in the two branches of the cold-air duct. In homes heated by steam or hot water, the method of heating, whether direct or indirect, and the provision, if any, for removing foul air will affect the consumption of fuel, which will vary with the percentage of the total radiation that is indirect and with the amount of warm air removed through vent stacks or grates. Owners of houses heated by different methods sometimes compare results and draw conclusions as to relative advantages of each system. If the houses are similarly situated and constructed and like conditions are maintained, these comparisons are of value, but such similarity is rare. The important bearing of ventilation on the fuel consumption may be illustrated by computations of the heat required for a two-storey brick and frame house. These computations show that if the air in the rooms is to be changed once an hour the amount of "radiation," or the quantity of heat to be delivered into the rooms, must be 25 to 30 per cent. more and if the air is to be changed twice an hour the "radiation" must be 50 to 55 per cent. more than without ventilation. When many persons are in a room it costs more, as a rule, to heat the air needed for ventilation than to supply the heat radiated from the building.

Life of Heating Apparatus

Another point to be considered in a discussion of the relative merits of systems of heating, although not one affecting so directly the fuel consumption or the convenience of operation, is the life of the apparatus or equipment. Ordinarily, but not always, a steam or hot-water boiler may be expected to be in serviceable condition after two hot-air furnaces have served their day and been replaced. To install a steam-heating system in a house of average size will cost, roughly, twice as much as to put in a hot-air system and somewhat less than to install a hot-water system, but the higher first cost of a steam or a hot-water system will in a measure be offset by low outlay for repairs or renewals

Convenience of Operation

As regards convenient and satisfactory operation, although much depends on factors other than the system of heating, yet each system has certain inherent advantages and disadvantages, some of which have been pointed out. With either a steam or a hot-water system of heating, radiators may be placed at any desired point in a room, although there is a prevailing belief that the radiators must be put in front of the windows to warm the cold air that descends from the glass cooling surface or enters about the sash or window frame. With a hot-air furnace there is a possibility, especially after the furnace has been in use for some time, of smoke and gases from the fire leaking into the air passages and being carried to the rooms, whereas with a steam or hot-water system there is ordinarily no chance for such leakage. If the house is not tight, the distribution of heat from a hot air furnace to the several rooms is easily disturbed by the wind and is less positive than with either a steam or a hot-water system and at times there may be trouble in heating the windward side of the house. Also, a furnace-heating system maintains a less even temperature because less heat is stored in it. In this respect, hot-water heating has a distinct advantage over both steam and hot air because the large quantity of water in the boiler, pipes, and radiators can maintain the temperature throughout the house for a considerable time after the fire dies down. In addition, the maintenance of an even temperature in mild weather is easier with the hot-water system because the temperature of the water in the radiators, hence the amount of heat given off, can be controlled within wide limits.

Size of Boiler and Furnace Size of Fire Pot

The type and size of the boiler or furnace selected is also an important but not generally recognized factor in determining fuel consumption and convenience of operation. Until the last five years both makers and buyers of house-heating boilers and furnaces gave little thought to the fuel to be burned. This neglect was a natural consequence of anthracite coal being generally used both in the east, where much of the heating apparatus was made, and in many places farther west ,and tests to determine the boiler or furnace capacity required to heat dwellings of various sizes were conducted with this fuel. In fact, the ratings published to-day for much heating equipment are based on the use of one of the larger sizes of anthracite. The sizes ordinarily used for domestic service weigh approximately 55 pounds to the cubic foot, whereas bituminous coals weigh from 47 to 52 pounds and coke from 30 to 40 pounds to the cubic foot.

To warm the air in a house and to supply the heat lost from the windows and walls a certain quantity of fuel must be burned in the heater, this quantity depending on the heat value of the fuel, the efficiency with which it is utilized, and on other factors. If to supply the necessary heat requires the consumption of 20 pounds of fuel per hour and the boiler or furnace is to keep this up for eight hours without attention, it is evident that the fire pot must be large enough to hold 160 pounds of fuel, and in addition the quantity necessary to rekindle a fresh charge, this quantity being ordinarily assumed to be 20 per cent. of the quantity of fuel in the fire pot after the firing, or in this case 40 pounds. Hence the fire pot must hold 200 pounds of fuel and still leave space for combustion.

If anthracite coal, bituminous coal, and coke are available and each has such heating value that 20 pounds of it will be required per hour to supply heat, the fire pot space occupied by an 8-hour charge of such fuel may be figured by dividing 200 by the weight per cubic foot of each fuel, the space thus calculated being approximately 3.6 cubic feet for anthracite, 4.0 cubic feet for bituminous coal, and 5.7 cubic feet for coke. Therefore if the fire pot were designed for anthracite, it would hold coke enough for a firing period of approximately five hours instead of eight.

Depth of Fire Pot

Not only is the capacity of the fire pot important, but its depth should receive consideration. If the full rated load is to be carried without attention to the fire for a minimum period of eight hours, the depth of the fuel bed be at least 12 inches. A heater that is to burn coke should be designed for a greater depth—probably 24 inches—on account of the bulkiness of the fuel and the different combustion conditions required for burning it satisfactorily. In fact, one of the largest manufacturers of boilers for heating houses by steam or hot water now designs such equipment for a fuel bed 18 inches deep when anthracite is to be used. As regards necessary size of fire pot, another detail that affects both economy and convenience of operation is the combustion space above the fuel bed.

Any unburned combustible gases that leave the fire pot are rapidly cooled in passing over the heat-absorbing surfaces between the fire pot and the smoke pipe, and their temperature is quickly brought below that necessary for ignition. If either anthracite coal or coke is to be burned, a relatively small combustion space above the fuel bed will be required because combustion takes place in or close

to the fuel bed. If bituminous coal is to be used, however, more space should be provided for burning the combustible gases rising from the fuel bed, or a considerable part of these gases will escape unburned, the flue surfaces will become coated with soot, and the heat losses will be large.

Passages From Fire Pot to Smoke Pipe

Another important detail, if bituminous coal is to be used, is the cross section for the gas passages between the fire pot and the smoke pipe. If the passages are not large enough the draft may be cut down by the accumulation of soot in the flues possibly to such an extent that the fire will go out. Also, if bituminous coal is to be used the flues should be of such size and so arranged as to invite frequent and easy cleaning.

General Considerations

The effect of the size of the boiler or furnace on convenience of operation can probably be more readily seen than the effect on fuel consumption. Obviously if the heater be smaller than the proper size, firing at shorter intervals will be necessary, drafts will have to be kept open, and the temperature of the escaping gases will be higher than if a heater of proper size is installed—between 375° and 475° F. in ordinary winter weather. The inconvenience resulting from too large a boiler or furnace is less than from one undersize, but careful handling will be necessary to control the fire satisfactorily in mild weather.

As regards the increased fuel consumption resulting from a heater being too large or too small, each hot-air furnace, steam boiler, or hot-water boiler has certain limits of capacity or rates of working within which it will do its work most economically. Below or above these limits a smaller proportion of the available heat in the fuel will be utilized in heating; in other words, the efficiency of the heater will be lower. Each heater has a particular capacity at which its efficiency is highest, but if the heater be properly designed, within a certain range of capacity the efficiency will be practically equal to the maximum. Obviously the equipment selected should be one that during most of the heating season will be operated within these limits, but will take care of maximum demands for a short time. In some European countries where fuel is relatively much more expensive than with us, some of the larger residences have two or more heaters and as many of these are used as the weather makes necessary, so that each is kept working within the most economical limits.

Kind of Fuel Used

Another factor determining fuel consumption and convenience of operation of heating apparatus is the kind of fuel to be used. As a rule, fuels are like other commodities in that the most desirable are the most expensive.

As previously pointed out, the ideal method of heating so far as convenience of operation is concerned is by the use of electricity, but the cost is ordinarily prohibitive. The situation in regard to the use of gas in house-heating boilers or furnaces is much the same except in those localities where natural gas is available at low rates.

Anthracite

Because of the desirable features of anthracite as a house-heating fuel, the consequent demand for it, and the increasing cost of production, the prices of the larger sizes have gradually increased. Many people who formerly burned nothing else in house-heating apparatus have come to feel that the convenience resulting from its use costs too much, and have changed to bituminous coal. Just what premium a householder will pay for this convenience can not be told, for it will depend on the locality and other factors. In some instances the higher cost of a more desirable fuel may be partly offset by a smaller cost of attendance, but usually such a saving will be negligible.

It may be possible, however, to burn some of the smaller sizes of anthracite with the furnace or egg size and thus effect a saving. The price per ton of these smaller sizes is less in proportion to their calorific value because they are in less demand and they can be used to advantage in banking the fire over night or in carrying a slow fire in moderate weather. Pea coal is probably the best size for such use, but unfortunately it and the smaller sizes are obtained with difficulty in many of the markets where the larger, or domestic, sizes are sold. The quality of anthracite sold by different dealers may differ decidedly, not so much from differences in the character of the coal in different mines as from differences in the carefulness of preparation at different mines, and of breakage in handling. Such differences will manifestly affect both the consumption of fuel and the attention needed by the fire.

Bituminous Coal

Among the various kinds and grades of bituminous coal the differences in fuel value and in their physical characteristics are much greater than among anthracites, and for that reason should receive especial attention. In every locality a number of coals will be available and the most satisfactory one in any particular case will usually have to be determined by trial, unless the characteristics of each and the effects of these are known.

Uniformity of size is a desirable characteristic, as it permits easier control of the fire. This is particularly true of anthracite, a mixture of sizes often accounting for poor results from a certain lot of coal. Sized or screened bituminous coal may be bought for its greater convenience, even though its cost may exceed that of lump coal or run-of-mine. In some localities slack coal has been burned successfully by some people, although it is believed that this would not ordinarily be possible because of the strong draft required.

Care of Furnace

Unquestionably with any fuel the prime factor determining fuel consumption and freedom from operating troubles ,although it may generally not be so recognized, is method of operation. Inasmuch as the proper methods of firing different fuels are discussed under another head, the authors will consider here only some general aspects of the subject.

The person most likely to be interested in proper methods of operation is the one who pays the fuel bills, and as a rule therefore it is to be expected that better results will be obtained if the firing is done by the householder than if some one is hired to tend the fires. However, something more than an interest in keeping down the coal bills is necessary; some knowledge of the characteristics of the fuel and of the functions of the different parts of the heater is required to save fuel and trouble.

Regulation of Draft

Many furnaces or boilers are operated in a haphazard way—drafts are opened or coal is put on when the house becomes cool, and then the fire is allowed to burn rapidly until either the rooms are too warm or the fuel bed is burned down too far to kindle properly a new charge of coal.

Such firing is always wasteful. The heater should receive regular attention, and if the demands for heat

Continued on page 34

EDITORIAL COMMENT

OUR readers, and particularly those personally acquainted with Col. J. B. Maclean, President of the Maclean Publishing Co., will learn with deep regret and heartfelt sympathy of the sudden death on August 17, of his son and only child Hector, aged sixteen years.

Hector was on a camping trip with Upper Canada College boys and was taken suddenly ill with acute indigestion. He was rushed in to Temiskaming, where medical attention was secured, but they were unable to save his life.

PLUMBERS ARE TOO MODEST

THERE is a whole lot of truth in what a manufacturer said to SANITARY ENGINEER recently, that the average man in the plumbing trade is far too modest. While the master plumbers and others who look after installations appreciate fully the value and the importance of the work they are doing, they are so close to it that they hardly ever think of impressing these things on the general public. It is said that one never appreciates good health until he is ill. If something happened suddenly and all the plumbers in the country ceased their work, it would only be a question of a very short time before the public would realize, and realize in no uncertain manner, that they are very necessary. The first places to be affected would of course be the large and populous cities. Without the sanitary arrangements which are made possible alone by the work of the sanitary engineers there would soon be outbreaks of disease that would menace many lives and cause endless illness and inconvenience. Without the heating engineers thousands and thousands of homes would have to go back to conditions as they existed in the days before modern equipment and methods made modern comfort possible. Imagine homes without plumbing, without hot and cold water, without bathroom equipment, sanitary equipment, and with old-time methods of heating and yet people one hundred years ago had to get along without these things. These are only a few of the things the work of the sanitary and heating engineer takes care of. He goes along about his business from day to day, works long hours and very often is called upon to attend to work that few people would undertake. He does it and does it thoroughly, but because he makes no noise about it and takes no pains to let the world know about it he is, comparatively speaking, unappreciated. In his hands is one of the most important matters of the whole nation, the national health. In his hands, to a great extent, rests the physical and material comfort of millions of people. Very few of these millions of people ever realize how dependent they are upon the plumber. There is such a thing as being too modest and it often looks as if the plumber were guilty of this and suffers accordingly in prestige because he hides his light under a bushel.

CULTIVATE SALESMANSHIP

MANY of the most aggressive plumbing and heating contractors are realizing as never before the possibilities that lie ahead for those who cultivate salesmanship. By comparing their own returns before they commenced to develop the merchandising side of the business with the increased turnover that has followed systematic efforts they can readily see that there is an opportunity that spells Profits. The best thing about the development of salesmanship is that it does not in any way detract from a man's ability as a plumber or heating contractor. It simply makes him a keener business man, more alive to the interests of his own shop and quicker to see opportunities to be of service to the public. This is really the great principle that underlies all successful business and the greatest merchants are those who have realized this and followed it out closely. The plumbing and heating contractor who is a good salesman will find no off days. He will be kept too busy and will have the satisfaction of seeing his trade steadily expanding and his profits accumulating. Men in the trade who have been developing the salesmanship idea, state to SANITARY ENGINEER, that it is easier to get results by going after business systematically than it is by the old haphazard methods. Looking back on the old plan they followed they see where they were not making the money they should and not getting the general results that they wanted to get year in and year out in a steadily growing trade. Men in other trades right alongside of them waxed more and more prosperous until finally the plumbing and heating men began to in-

vestigate and try to find out why they did not get along too. They found out that getting results in business means doing business in a businesslike way. The principles are not hard to learn, and if followed out produce certain, definite returns. Salesmanship and business go hand in hand and may be developed. No matter how good a worker a man is or how much he knows about his trade, unless he develops salesmanship and business system he will be handicapped in the race.

BUSINESS MEN SHOULD HELP

BUSINESS men, if they will, can lend most valuable help in the making of better laws. Their efforts can be exerted not only locally but in bettering provincial and federal legislation. Men who by their sheer ability to grapple with and master business problems have won success possess qualities which fit them for dealing with civic and general public problems. One of the worst things that is frequently said about the Government at Ottawa and the smaller but important governments in scores of Canadian municipalities is their utter failure to conduct business in a business-like way. The merchant who governs his own business successfully is eminently fitted for taking his share in helping solve community difficulties. His advice and counsel based on long experience would be invaluable. Probably at no time in the history of the Dominion are men of this kind needed to direct public affairs so badly as at present. Canada is at an important stage of its development and if left to the devices of the professional politicians the country may be set back for many years. Business men have had good reason to know just how little aggressive or constructive leadership there is at Ottawa when commercial interests are at stake. With this in mind, and the future of Canadian business depending upon the action that is taken, or not taken now, business men owe it to themselves to take an interest in the law making that is to be done.

COAL FAMINE FEARED

FROM time to time notice has been directed by SANITARY ENGINEER to the coal situation and the fears of a shortage during the coming winter. Conditions according to the latest information available are growing steadily worse from a production standpoint. Canada looks to the United States for sixty per cent. of its requirements and at the present time production in the American mines is twenty per cent. below actual requirements. A few winters ago many merchants had it vividly impressed upon them what a coal shortage means in severe weather and what effects it has on business. The situation now presenting itself has a most important aspect for heating men. There will undoubtedly be a big demand for heating equipment. Wood in many sections of the country is almost as expensive and as scarce as coal. Electricity and oil are the two substitutes that have been steadily increasing in popularity. In many districts, of course, electricity is not available. There is every indication that the calls for oil-burning equipment this fall and winter will break all records.

NEW BOARD ON JOB

THE new Board of Commerce has a big task ahead of it. In plumbing trade circles in Canada, as in other trades, rumors have been going the rounds for many years of alleged combines, associations and other influences that are supposed to curtail production and boost prices, and in other ways stifle competitive effort. If illegal practices exist they should be wiped out, and the new Board, it is expected and hoped, will either kill or cure the evils, if they are found to exist. Present indications are that the Board will get down to business at an early date.

ARMISTICE DAY AND NOW

DURING the last months of the war there was a very widespread uneasiness in regard to what the cessation of hostilities might mean to prices. There was a fairly general feeling that the bottom might drop out of things with calamitous results to the merchant and others.

SANITARY ENGINEER could not see matters in this light, and persistently stated that prices would not decline appreciably for many months after the war, perhaps even for years. At that time we spoke of world markets bare of goods, and of depleted reserve stocks, and announced our belief that under these conditions declines were not within the realms of possibility.

The passing months have vindicated this contention. Not only have there been no sharp declines, but as a matter of fact in perhaps the majority of instances the trend of prices has been in an upward direction since the signing of the armistice.

Now "Peace Day" has come and gone, after nine months of armistice conditions, and the world is settling down to the knowledge, that conditions that took years to produce cannot change in a moment. There is no fear of slumping prices—SANITARY ENGINEER said this nine months ago, and it says so again to-day. There will be downward revision, but the fear of tobogganing prices was a nightmare that had no sound basis in fact. The part of reasonable caution is always the part of wisdom, but the man who waits for a landslide in prices is facing a very considerable wait.

Rules for Computing Required Radiation

"Domestic Engineering" Gives the Following Abstract of the Rules Submitted to the National District Heating Association by the Rules and Regulations' Committee

IT has been the desire of a great many members of the association for the past few years to have the National District Heating Association adopt a standard rule for figuring required steam and hot water radiation. There have been several papers on this subject presented before the association in the past and as there was such a great number of rules used by the various member companies, some of which did not check within 50 to 75 per cent. of each other, the adoption of a standard rule has been carried over from year to year by the association with no action taken.

Two years ago when the educational committee decided to get up an association handbook, it was suggested that they adopt a standard rule for figuring radiation, which would be known as the National District Heating Association rule, and make it a part of the handbook.

The Educational Committee was so busy that year with other matters that very little work was done on the radiation formula, and when the new committee on rules and regulations was appointed last year, the formulating of a standard rule for figuring radiation was turned over to them.

There have been numerous drafts of a proposed rule submitted to the committee members in the past three months, and as there are fourteen members on the committee, there has been a great deal of criticism and discussion on same, which resulted in a great many changes and additions to the original draft. Some of the members were of the opinion that the scientific method was too complicated, and that we should adopt a rule similar to rules Nos. 2 and 3. Other members were of the opinion that further additions should be made to the rule. As a result the rules which the committee is now submitting to the association for its approval and adoption do not meet with the individual ideas of each member, but the committee is agreed as a whole that if the proposed rules are adopted by the association as their standard, there is sufficient data in same so that the various members of the association can compile simplified formulas to fit their local conditions if they do not care to adopt rule No. 1 for general use.

Table No. 4 of rule No. 1, which gives the coefficients of heat transmission from the various types of radiation and pipe coils, is the latest addition to the proposed rules, and while they will probably not be used for general use, they are included for use by engineers who wish to go into complete detail in the design of heating systems.

Suggested rules Nos. 2 and 3 are samples of simplified rules which can be computed from the data in rule No. 1 to fit and fixed local conditions. It is the desire of the members of the Rules and Regulations Committee in publishing the proposed rules in the bulletin to have all members of the Rules and Regulations Committee in before the convention in June, at which time the formal adoption will be requested.

Rules for Determining Square Feet of Radiation Required to Heat a Building

The following rule No. 1 is what is known as the B.t.u. rule for figuring radiation and can be applied to any condition of temperature differences or any type of heating system, either steam or hot water. It is recommended for use to member companies, heating engineers, architects and heating contractors.

Rules Nos. 2 and 3 are examples of rules which are known as simplified or short-cut methods for computing required radiation. They are made up from the factors in rule No. 1 and fit a certain type of building construction and temperature difference. When circumstances make it advisable, in the case of any particular heating company, to have in use a simplified formula, a rule similar to rules Nos. 2 and 3 can be made up from the factors in rule No. 1 to fit local conditions, with an average type of building construction.

Any room or space having an opening which may communicate with the rooms or space to be heated, whether radiation be installed or not in such rooms or space must be considered in the measurements for space heated in either of the following ways, depending on the existing conditions:

1. If the unheated space is an active room and has a door or other opening which opens into the adjoining heated space and such doors or openings are left open the majority of the time, the entire space should be included in the measurements and sufficient radiation installed in the heated rooms.

2. If the unheated space is an active room and the doors or other openings are left open the majority of the time, the space and exposures of the unheated room should not be included in the measurements, but the walls adjoining the unheated and heated space should be taken as exposed surface in the measurements for the heated room. Basements and attics, which are used for storage purposes only, should not be considered as space to be heated.

Following are the three rules referred to above.

Rule No. 1

Since the radiation in any room must emit sufficient heat to compensate for all heat losses from that room and since heat is transmitted by different building materials at different rates, it follows that:

Radiation required = B.t.u. lost per hr. from room ÷ B.t.u. emitted per sq. ft. of radiation per hr. = H ÷ B.t.u. per hr. from radiation.

R = H ÷ X (temperature difference between contents of radiator and room temperature).

The value of X in the following computations is taken as 1.7 B.t.u., which is the coefficient of heat transmission from the type of radiation most generally used. See table No. 4 for coefficients for various types of radiation and pipe coils.

Gravity straight steam systems having from 1 to 3 lbs. pressure:

$$R = \frac{H}{1.7(220-70)} \text{ per season 3-lb. gauges} = \frac{H}{255}. \text{ Safe Value} = \frac{H}{250}$$

Vapor systems with individual traps on the return end of each radiation:

$$R = \frac{H}{1.7(212-70)} \text{ for steam at atmospheric pressure} = \frac{H}{241}$$

$$\text{Safe value} = \frac{H}{240}.$$

Atmospheric systems with open trap return and excess radiation for cooling surface:

$$R = \frac{H}{1.7\ (212-70) \div 120} = \frac{H}{200}$$

Hot water systems having an average of 170 degrees water:

$$R = \frac{H}{1.7(170-70)} \quad \frac{H}{170} \quad \frac{H}{165}$$

Theoretically, one B.t.u. will heat 55 cu. ft. of air one degree F., allowing for safety and simplicity in figuring. Fifty cu. ft. are used, which makes the constant for one change .02 B.t.u. per degree difference in temperature.

In computing required radiation for well-constructed residences and office buildings, good practice allows one change of air per hour; well-constructed store buildings two air changes per hour. For buildings of loose construction and those employing some method of forced ventilation, more air changes per hour will be considered, depending upon the existing conditions of buildings and ventilating system.

Table No. 1 shows the B.t.u. required to heat one cubic foot of space at various temperatures and air changes.

Table No. 2 shows the B.t.u. losses per hour through one square foot of various building materials with varying temperature differences.

Table No. 3 shows the percentage by

TABLE NO. 2.

	B.T.U. Difference K	Difference in Temperature Between Room and Outside. 50°	60°	70°	80°	85°	90°
Windows, single glass, full sash area	1.25	62	75	87	100	106	112
Windows, double glass, full sash area	.60	30	36	42	48	51	54
Plate glass	1.00	50	60	70	80	85	90
Skylight, single glass, full sash area	1.10	55	66	77	88	94	99
Skylight, double glass, full sash area	.60	30	36	42	48	51	54
Wooden door, 1-inch	.40	20	24	28	32	34	36
Wooden door, 2-inch	.36	18	22	25	29	31	32
Brick wall, 8½-inch plain	.37	18	22	26	30	32	33
Brick wall, 13-inch plain	.29	14	17	20	23	25	26
Brick wall, 17½-inch plain	.24	12	14	17	19	21	22
Brick wall, 22-inch plain	.21	10	13	15	17	18	19
Brick wall, 27-inch plain	.19	9	11	13	15	16	17
Brick wall, furred and plastered, use .7 times non-furred.							
Stone wall, use 1.5 times brick wall.							
Concrete, 2-inch solid	.78	39	47	55	62	66	70
Concrete, 3-inch solid	.71	35	43	50	57	60	64
Concrete, 4-inch solid	.66	33	40	46	53	56	59
Concrete, 6-inch solid	.56	28	34	39	45	48	50
Frame wall (plaster, lath, stud, clapboard)	.50	25	30	35	40	43	45
Frame wall (plaster, lath, stud, sheathing, clapboard)	.28	14	17	20	22	24	25
Frame wall (plaster, lath, stud, sheathing, paper, clapboard)	.23	11	14	16	18	20	21
Hollow tile, 2-inch, ½-inch plaster, both sides	.41	20	25	29	33	35	37
Hollow tile, 4-inch, ½-inch plaster, both sides	.33	16	20	23	26	28	30
Hollow tile, 6-inch, ½-inch plaster, both sides	.28	14	17	20	22	24	25
Solid plaster partition, 2-inch	.60	30	36	42	48	51	54
Solid plaster partition, 3-inch	.50	25	30	35	40	43	45
Concrete floor on brick arch	.20	10	12	14	16	17	18
Fireproof construction as flooring	.10	5	6	7	8	9	9
Fireproof construction as ceiling	.14	7	8	10	11	12	12
Single wood floor on brick arch	.15	8	9	11	12	13	14
Double wood floor, plaster beneath	.15	8	9	11	12	13	14
Wooden beams planked over, as flooring	.17	9	10	12	14	14	15
Wooden beams planked over, as ceiling	.35	17	21	25	28	30	32
Lath and plaster ceiling, no floor above	.62	31	37	43	50	53	56
Lath and plaster ceiling, floor above	.25	13	15	18	20	21	22
Steel ceiling, with floor above	.35	17	21	25	28	30	32
Single ¾-inch floor, no plaster beneath	.45	23	27	32	36	38	41
Single ¾-inch floor, plaster beneath	.26	13	16	18	21	22	23

Percentage of Increased Radiation Due to High Ceilings.

Room 12 to 14½ ft. from floor to ceiling	3%
Rooms 14½ to 18 ft. from floor to ceiling	6%
Rooms 18 ft. and above from floor to ceiling	10%

which the B.t.u. loss obtained from table No. 2 will be increased when the exposure is other than southern.

To compute the radiation required in any room:

First—Compute the B.t.u. required to heat the air in the room by multiplying the cubical contents by the proper factor.

Second—Compute the B. t. u. lost through the doors and windows by multiplying their area by the proper factor.

Third—Compute the B.t.u. lost through the walls, floor and ceilings in the same manner.

For steam radiation (one to three lbs. pressure)—Divide the sum of these results by 250 and the quotient is the number of square feet of straight steam radiation required.

For vapor radiation (with radiator traps)—Divide the sum of these results by 240 and the quotient is the number of square feet of vapor radiation required.

For atmospheric radiation (with extra cooling surface)—Divide the sum of these results by 200 and the quotient is the number of square feet of atmospheric radiation required.

For hot water radiation (water at 170 degrees F.)—Divide the sum of these results by 165 and the quotient is the number of square feet of hot water radiation required.

Percentage by which the heat losses given in table No. 2 are increased if the exposure is other than southern:

TABLE NO. 3

Location.	Heat Loss is Increased Per Cent.
E. or W. rooms	5-10
N.E. or N.W. rooms	10-15

Value of X, coefficient of heat transmission from radiators:

TABLE NO. 4.

Height of Radiators Inches	One Column	Two Column	Three Column	Four Column
20	1.93	1.85	1.75	1.64
23	1.89	1.80	1.70	1.59
26	1.86	1.76	1.66	1.56
32	1.79	1.69	1.59	1.49
38	1.74	1.65	1.55	1.45
45	....	1.60	1.50	1.40

B.T.U. per sq. ft. per hour per deg. dif. in temperature

WALL COIL:	
Heating surface—	
5 sq., ft., long side vertical	1.02
5 sq. ft., long side horizontal	2.11
7 sq. ft., long side vertical	1.70
7 sq. ft., long side horizontal	1.92
9 sq. ft., long side vertical	1.77
9 sq. ft., long side horizontal	1.98
PIPE COIL:	
Single horizontal pipe	2.65
Single vertical pipe	2.55
Pipe coil 4 pipes high	2.48
Pipe coil 6 pipes high	2.30
Pipe coil 9 pipes high	2.12

TABLE NO. 1.

No. Air Changes	B.T.U. 1° Difference	Difference in Temperature Between Rooms and Outside. 50°	60°	70°	80°	85°	80°
½	.01	.50	.60	.70	.80	.85	.90
¾	.015	.75	.90	1.05	1.20	1.27	1.35
1	.02	1.00	1.20	1.40	1.60	1.70	1.80
1½	.03	1.50	1.80	2.10	2.40	2.55	2.70
2	.04	2.00	2.40	2.80	3.20	3.40	3.60
3	.06	3.00	3.60	4.20	4.80	5.10	4.50
4	.08	4.00	4.80	5.60	6.40	6.80	7.20

Rule No. 2

Rule No. 2 is to be used for computing the required steam radiation for a building assuming a temperature of 70 degrees inside with an outdoor temperature at zero, with 13-inch brick walls or average frame construction. Windows, single glass, set tight, and assuming one and one-half changes of air per hour in the building.

R=.008C+.08W+.35G.

R=Required steam radiation with system using steam at 1 to 3 lbs. pressure.

C=Cubic feet of space to be heated.

W=Square feet of exposed wall surface.

G=Square feet of exposed glass surface.

Note—No allowance made for extreme exposures.

Rule No. 3

Rule No. 3 can be used for computing required hot water radiation for a building, assuming a temperature of 70 degrees inside with an outdoor temperature at zero, with 13-inch brick walls or average frame construction. Windows, single glass, set tight, and assuming one and one-half changes of air per hour in the building.

R=.013C+.12W+.53G.

R=Required hot water radiation with average temperature of water in system of 170 degrees F.

C=Cubic feet of space to be heated.

W=Square feet of exposed wall surface.

G=Square feet of exposed glass surface.

Note—No allowance made for extreme exposures.

A simple device for improving the shearing strength of bolted joints in wooden structures has been brought out by Professor C. Forssell, of Stockholm. It takes the form of a corrugated washer, which is threaded on the bolt between the two pieces to be joined. The bolt is tightened against a pair of plain washers on the outside with sufficient pressure to force the corrugations into the wood. The strength of the joint is thus unaffected by the bolt hole, and depends on the friction between the two surfaces which are proportionate to the size of the washer and the depth of the corrugations. The strength of the joint is increased, according to Ingenioren, about twofold. The washers are known as "Bufo" washers, and made in various sizes, but all 1-16 in. thick, with corrugations about 9-32 in. high. In order to permit sinking into the wood, it is necessary to remove all knots at the joints to a depth of 3-16 inch. to 3-8 inch. The bolt is screwed up with spanners not less than 2 ft. to 2½ ft. long, and it is necessary to repeat the process after the first 48 hours and a further 72 hours.

An American still holds the world's airplane altitude record with 28,900 ft., as recent rereading of the British claimant's instruments showed a revised height of only 27,000 feet.

News from Here and There

CONTRIBUTIONS OF NEWS GLADLY ACCEPTED

BUSINESS CHANGES

Winnipeg.—J. Rychlenski has purchased the plumbing business of Andrew Guest.

NEW FIRMS

Aug. Brunelle, plumber, etc., has been registered at Montreal.

Lapointe & Cote, Limited, plumbers, Quebec have obtained a charter.

OBITUARY

The death occurred at Montreal of Samson Roch.

The funeral took place at Edmonton cemetery, and was very largely attended by members of the trade and the public in general.

The death of J. A. Lockerbie, of Edmonton, Alberta, occurred on August 1 at the family residence, 10309 116th street, after an illness of little over a week. He leaves a widow and two children.

Mr. Lockerbie was a resident of Edmonton since 1899, coming at that time from Owen Sound, Ont. He was engaged in the plumbing business under the firm name of J. A. Lockerbie, Limited, of which he was senior member, president and manager; his brother, Douglas, is also a member of the firm.

After an illness of about three months' duration Mr. George E. Finlay, formerly of Mitchell, Ont., died on August 31 at his residence, 185 Pape avenue, Toronto. Mr. Finlay was born at Mitchell 33 years ago, and after some time spent at Collingwood, went to Toronto about eight years ago. He was engaged in the plumbing business, but recently became connected with the firm of Imont Agnes Company, Limited. The funeral was held at Collingwood, Ont.

QUESTION BOX

Editor,
Sanitary Engineer,
Toronto.

Will you kindly tell me the quantity of B. T. U's. a 2,000 watt electric water heater should be capable of generating per hour, and also the best method of figuring the size of heater required for a given number of B. T. U's. required end the cost of energy required.

Yours truly,
A. T.,
Montreal.

ANSWER: The heating value of one watt hour in B. t. u. is 3.412. Therefore a 2,000 heater should be capable of generating 6824 B. t. u., or in other words enough heat to raise the temperature of 97 lbs. of water 70 degrees Fahr. in one hour.

The cost of the energy required varies with the charges made by the companies supplying electric current. When paying 3 cents per kilowatt hour, the cost of heating may be estimated at 3 cents per 3400 B. t. u.

To make an estimate of the size of heater needed; divide the number of B. t. u. required per hour by 3.412, this will give in watts the capacity of the heater that should be specified.—Ed.

TENDERS

The Board of Education at Carleton Place, Ont., plans the erection of a new four-roomed public school.

WAGES AND HOURS TO BE CONSIDERED BY MONTREAL ASSOCIATION

While it was intended to take up the discussion of wage scale and hours at the meeting of the Montreal Master Plumbers on August 21st, this important matter was not reached. It will probably be taken up at the adjourned conference on August 28th.

It will be recalled that the Master Plumbers, assembled in their recent convention at Montreal, expressed their willingness and their earnest desire to meet their employees on a fair and generous basis of remuneration. The burden of increased wages has been a heavy one and still the members of the craft have realized the necessities of the case and have, in many instances, made advances of considerable extent to the men without request.

From present indications it may be necessary to go farther and meet a flat request for ninety cents per hour to first-class men. This is a big wage and it is one which has never before been equalled. But with a high type of workmanship and a speeded-up service, there is no question as to the amount of work that can be accomplished. Faithful and conscientious work will prompt the paying of bigger wages and will undoubtedly justify it.

There has been some suggestion of a general strike developing among the various sections of the building trades here. Whether this will transpire will be decided next week, it is expected. In the meantime little difficulty has been reported from plumbers of the city.

A CORRECTION

In the last issue of SANITARY ENGINEER, under the Question Box heading, appeared the following question and answer:

Rodney, Ont.

Editor SANITARY ENGINEER.—Would you kindly advise me if a 2½-inch pipe would work satisfactory on a pump, the cylinder being fitted for 2-inch pipe?

Yours truly,
D. MISTELE.

Answer.—The 2½-inch connection may be used, but it will reduce the efficiency of the pump by about 40 per cent. If the pump is installed for a lift of about 30 feet you will find that with this connection that the limit of the lift will be 12 feet.

Where the answer says: "Pump is installed for a lift of about 30 feet," it should have read "20 feet." This would be quite clear were a moment's thought given to figuring same out, the error being a typographical one.

MAY INSTAL PLANT

The city engineer at Hamilton, Ont., has recommended the installation of a sterilizing plant at the beach pumping station. The council has decided to ask the medical health officer and city engineer to submit a full report as to the need of one.

HUGE NEW ROLLING MILLS

According to press reports the new steel rolling mill which is to be erected on the British Forgings site at Ashbridge's Bay by Baldwins, Limited, of Swansea, Wales, is to be known as Baldwins Canadian Steel Corporation, Limited.

A. M. Russell, of Hugh Russell & Sons, Montreal, is to be president of the new company, which is expected to provide employment for 2,300 men within a year.

MOLINE HEAT

Moline Heat, Moline, Illinois, has issued a most attractively printed catalogue in which is described in complete detail the "Univent." A history is given of heating and ventilating and of the evolution of the Univent. The catalogue contains thirty-two pages, 11 by 8½ in., and many of the illustrations are in colors. Readers of SANITARY ENGINEER who are interested may obtain a copy of the catalogue on request. The firm has also issued a booklet in which is described the Liberty draft controller.

LETTERS TO THE EDITOR

These columns are open to contributions upon any topic of interest to the trade, it being understood that the views expressed are those of the contributors, and do not necessarily imply editorial indorsement. Names of contributors will be withheld, if desired, but name of writer must accompany correspondence as an evidence of good faith.

A MEANS FOR THE CONVERSATION OF COAL

Ottawa, Can., Aug. 22, 19.

Editor, Sanitary Engineer—As there are several indisputable reasons why anthracite coal will be scarce and of high price during the winters of the future, I am of the opinion that City Councils or private corporations should follow the example set by the Dominion Government and construct central heating stations for the business districts of their cities.

The Government plant at Ottawa will, when completed, supply heat to seven large buildings besides the Parliament buildings.

Would Conserve Coal

This, to my mind, is the "only solution" for the conservation of our anthracite coal, also a means for reducing the overhead expenses for furnace attendance, and removal of ashes, which are injurious to the merchant's stock. Pedestrians on our business streets would not run the risk of having a shovel of coal around their lower-limbs, as is often the case during coaling-up time. These are not the only advantages that would be gained by the business blocks of cities being heated from central plants. There is the ever-present risk of fire through carelessness with hot ashes, or through explosions caused by inexperienced caretakers, sometimes resulting in loss of life.

An Important Matter

It is as necessary to conserve created wealth as it is to prevent waste of natural resources. We pride ourselves on our up-to-date fire brigade, maintained at a great cost. Should we not give attention to the prevention of these conflagrations that are continually occurring in our cities? As most stores are full of inflammable goods, such places when on fire often have an attraction for neighboring stores, consequently there are for months ugly gaps in the business streets of our cities. Money burned up that can never be replaced.

"Marching Backwards, So to Speak"

Would it not be a blessing to have all our hotels heated by central plant system. There are many reasons why such should be. It has been said that the fire waste of our cities and towns is greater per capita than in any other country in the world, and constitutes an enormous drain upon the resources of the Dominion, no wonder lumber is high in price.

We are a nation of money-makers, but we are told that we are a wasteful people. Should we not use every means to prevent fires rather than be content to pay a high rate of insurance on buildings and stocks, thereby reducing the merchants' overhead expenses and enable him to sell his goods cheaper.

Little Interest Shown

It is surprising that more interest has not been taken in the past in our cities regarding central heating systems. Such plants are in successful working order in the number of between 300 and 400 in the cities of the United States and paying good dividends. One plant in Detroit is furnishing heat for 1,500 customers. In Ottawa, for instance, such a plant could be installed on Albert Street, where the theatre was burned down. It could supply heat to all the business premises on both sides of Sparks Street from the Russell House to Bank Street.

Careful Tests Made

Careful tests have been made on store and such-like heating boiler furnaces which has shown that from 35 to 50% efficiency was all that was being obtained from the coal. Tests made with up-to-date furnaces of a central heating plant show 75 to 80% efficiency from the coal burned. The reason for this is that the combustion of the coal is carried out on scientic lines. Equipment is used that requires the services of a man of more experience in the management of boilers than is found among packers or cellar-men. Take, for instance, the amount of coal, which is principally anthracite, that is consumed each winter in the buildings of our business districts of our cities. If this coal could be saved each winter would it not leave more anthracite for use in private residential heating, and as the demand for this grade of coal would not be so great, would it not cause it to be cheaper.

Difference in Cost

The difference in cost between anthracite and the grade of coal that can be used in furnaces of up-to-date central heating plants is over 100% screening or the run of mine. Nova Scotia coal would answer well, and with proper equipment can be burned without any black smoke issuing from the stock; a light yellow haze, hardly perceptible, is the result.

These are the days for efficiency.

We never miss the water till the well runs dry. This matter should not be deferred till anthracite coal costs $25 per ton. In the days of my apprenticeship it was $4.50 per ton.

Registered on Meter

A supply of steam is brought into a building similar to gas or water, and is registered on a meter. Should a building be heated by hot water, converters are used, in which the water is heated by steam instead of a coal fire. The temperature of the water is more uniform and easier regulated than with coal fire. No alteration of existing piping is necessary. The Eastern Departmental Block, also the new Customs House in this city, are heated by these converters, and have given every satisfaction.

Difficulty Overcome

Central heating systems like electric lighting and many other works when in their infancy gave trouble, owing to lack of knowledge regarding the expansion and contraction of the underground pipes, also for lack of knowledge regarding the conservation of the heat from them, but these matters are a thing of the past, perserverance has been rewarded. Steam can now be conveyed thousands of feet in underground mains if properly insulated.

An Invisible Gas

Some people have an idea that steam is of a nature like smoke; this is not so. Steam is an invisible gas, but when in contact with the atmosphere, condenses to a watery white vapor, and is visible. Obviously the better the pipes are protected the less steam will be condensed in them and the higher the efficiency of the plant and larger dividends.

In cities where waterfalls are not available as motor power for electric light plants, great economy in coal would result by having central heating systems in connection with them, as the exhaust steam from the dynamo engines could be turned into street mains for heating buildings.

A Long Season

Of all the peoples of the world we in this part of Canada depend on artificial heat for our very existence for a good half of each year. Should we not see to it that every means that is possible for the conservation of our coal is applied. Very much could be written on this subject. I may, however, point out that with up-to-date furnaces of central heating plants the very poorest or smallest grade of coal can be used, even if as fine as gunpowder. So also can lignite or even peat.

Since writing the above I hear that our City Council is contemplating the installation of a central heating plant for their municipal buildings. This is certainly a step in the right direction, which the electors should approve.

RUSTLERS

I served my time under an old "stiff-necked Glassco beggar," a Scotchman who was perfect master of the trade, who could line a tank such as I have not seen the superior in all my experience. He took one and a half days at the job, but it was finished perfectly and you could see that a mechanic had been at it. One day a Jour blew in and wanted a job, which was quite an event in our village. The old man hired him as he had three or four soft water jobs, and started the lad lining tanks. The lad dug in and how he did rustle and had two tanks lined in the day. They were fair jobs—I have seen hundreds not so good since then—and they did not leak. Imagine my surprise when the old man started in to him like a bull at a gate and told him that such ——— fools as him spoiled the trade, paid him up and let him go. For years that stuck in my crop, and I never could get the old man's glasses to look his way, and I thought he was going in his dotage till a few years ago. Then I saw a rustler come to town (we have grown since), and we hired him, for, though his work was a little rough he could get through a pile of it, and he just seemed to live to work. How he seemed to enjoy it, and what a money-maker he was for us! How we touted him, nursed him and told everyone what a good man he was! A year ago he started opposition to us and now we do not think he is so nice. We have rust in our joints, and are not as young as we used to be, and we have to sit up nights planning how we can work fast enough to keep up to his competition. Who was the wisest, the old man or us?

More to come,

"RATSY."

PRACTICAL SHEET METAL WORK

Continued from page 35

2, and transfer the measurements from quarter pattern E, Fig. 1, to Fig. 2, as shown, beginning at 1 to 6 and 6 to 1. This will only give pattern for one-half of the design, which means that four pieces like Fig. 2 are required to make a cone.

The quarter pattern shown at E in Fig. 1, is simply a round flat flange which forms the lower half of piece C. No seam allowance is needed for this pipe, as it should be fitted to the underside of C, and C should be made large to enable it to be placed over piece E. Fig. 1 is almost self-explanatory and requires no further description.

The erection of 300 modern houses in Kitchener, Ont., is being considered by the Dominion Rubber System, which operates four industries in the city.

Heating and Ventilating

HEAT

Eleventh Article of Series Prepared for Readers of "Sanitary Engineer" by N. A. Kearns

Editor's Note.—This article is the eleventh of a series prepared especially for the readers of SANITARY ENGINEER, covering heating and engineering practice reduced to its simplest terms. Readers will find this article on "Heat" a complete and most illuminative one. The first article of the series appeared in the April 1 issue. Descriptions of installations made in different classes of buildings will be given, together with the method used in making the design for these installations. It is not our purpose to give complicated formulas, but rather to present the simple rules that have been based on these formulas, in such a way that the reader will be enabled to design a heating and ventilating system without having to refer to the data given in engineers' hand-books. The author of these articles, Mr. N. A. Kearns, has designed heating and ventilating equipment for all classes of buildings in practically every province of the Dominion. Some of the buildings were such that the heating and ventilating equipment had to be installed under the most adverse conditions, whereas in other buildings the design for the heating and ventilating equipment was incorporated in the constructional drawings. The twelfth article of the series will appear in the next issue.

MOST people consider that they have a clear understanding of what heat is; but when they are asked to define it, their answers are likely to be: "Why, it is the opposite of cold."

Very well then. What is cold?

Now we are struck for awhile, and then we say: "Cold is low temperature."

"What is temperature?"

We might keep on with such questions forever and not come to any clearer conception of the nature of heat than if we were discussing the thickness of the hide of a rhinoceros.

The answer to the question is that heat is a form of movement.

All substances are made up of small bodies that can exist separately. Some of these bodies have a greater physical or chemical attraction for certain kinds of different bodies than they have for others.

Some physicists claim that these small bodies are constantly in motion; no matter how dense the material may be that they form. And just as the stars swing around the sun in this solar system, so these small bodies—molecules—are in motion around the centre of their particular attraction. To these men a piece of ice is not a dead thing. The density of its apparent quiescent state is due not to an absolute cessation of the movement of the molecules, but to a slowness of movement that we, in our limited power of perception, are not allowed to define.

A piece of wood also contains molecules that may be so disorganized that their movements becoming rapid cause a separation. When molecules reach a certain state of vibration, they can no longer exist with other molecules of a different nature and then an action takes place that sometimes results in what we term "combustion."

The molecules in the block of wood may be set into a high vibration by transference of a vibration from a fire or they may be set into this action by the energy expended by friction.

With the increased liveliness of the molecule there comes what we term a higher temperature.

Temperature is a relative term that we used in rating the vibration of the molecules. When two substances are placed close together, the vibrations of each tend to become uniform, thus:

A block of ice formed from a pound of water is dropped into a vessel containing 2 lbs. of water at 160 degrees above zero Fah. The higher vibration of the 180 degree-water are transferred to, and set up a corresponding movement, in a block of ice. After a short time the ice is dissolved, and when we use a thermometer to test the temperature, or vibration of the water we find that the thermometer gives a lower reading than the original 180 degrees. Thus we see that the slowness of molecular movement in the ice was transferred to the water at the same time that the faster molecular vibrations of the water entered the body of ice. So we come to understand that it is the rate of the molecular movement that indicates temperature and that causes heat or cold to move from one body to another.

Matter cannot be destroyed. It can only be changed in form. When we burn a piece of coal we only succeed in separating the elements that formed that substance. Some of these elements have passed off in gases that perhaps ultimately may combine with other elements to form coal again. Thus there is a constant cycle of molecular energy throughout the varying stages of being.

To understand the transference of heat we must believe, without expectation of other proof, that there is a fluid so fine that it is contained in every substance; that is in all space away beyond the atmosphere of the earth; that cannot be exhausted from any vessel, in a word that it persists forever. (This fluid is known as ether.) This fluid can be caused to vibrate as water may vibrate when a stone is thrown in it. The discharge of an electric spark causes the ether to vibrate in waves corresponding in length to the length of the spark and in radius to the intensity of the discharge.

Waves of light and waves of heat are carried from the sun to the earth by the medium of this fluid. The radiant heat from a direct radiator is carried in the same way.

The ether does not conduct heat as a bar of iron conducts it. The iron becomes warm because of the increasing molecular vibration; but the ether does not become warm. A few thousand feet above the earth the cold is intense because there is no palpable substance where the heat waves caused by the sun may be arrested and stored.

Now, although the surface of the earth is closer to the sun than is the centre, we know that the deeper we go into the earth the warmer it becomes. The inner heat is supposed to be due to the still un-

quenched fires of creation and is known as terrestrial heat.

Heat may be caused by compression; by friction; and by chemical combinations.

The principle governing the propagation of heat is the principle aiso governing the making of ice.

In heating systems the object is to get the heat out of the combustible and into the room to be heated. In refrigerating systems the object is to get the heat out of the substance to be frozen.

Where a steam heating system is used the steam becomes hot because of the taking of heat from out of the fuel. In a refrigerating system the water becomes frozen because the heat has been taken from it to vaporize some liquid with a lower vapour point than that of wataer.

In the first article of this series the unit used in the measurement of the effect of heat was taken up in detail. The Engineer must have just as clear an understanding of what the heat unit means as he has of the existence of water. It is utterly impossible to do any very fine figuring or to design anything original without that understanding; and so the wise man considers no time wasted that is spent in seeking for information that may assist in visualizing in his mind the properties of heat.

When water is soaked up in a sponge, a temperature change takes place due to capillary heat.

Heat because it is a form of energy may be changed into work and thus a heat unit may be also considered as a measurement of work.

The unit of work is the mechanical horse power, i. e., the work required to lift 33,000 lbs. 1 foot in a minute. When using the mechanical horse power as a basis for figuring equivalent heat, a person is likely to lose track of their figures in transposing dynamite effect to heat. A heating horse power may be considered as being 42.4 B.t.. in a minute or 2,545 B.t.u. an hour.

In electricity the work unit is the joule per second— 1 watt. There are 746 watts in one horse power, therefore one watt is equivalent to 3.41 B. t. u.

In the close figuring of surfaces for heating or for ventilation, it is often the custom of engineers to consider that heat is radiated from the bodies in a room in proportions approximating the following figures:

Gas light, split burners, 300 B.t.u. per hour.
Coal oil lamp, 160 B.t.u. per hour.
Electric light, per watt, 3.4 B.t.u. per hour.
Small child, 240 B.t.u. per hour.
Adult, 400 B.t.u. per hour.

When we understand how one pound of distilled water at 63 degrees Fah. is the basis of our standards it becomes easy to allow for other substances when we are in possession of the specific heat and weight of such. Some of the articles following this will be composed entirely of tables giving specific weights and heat values.

Ventilating the Modern School

Tenth Article of Series Written Especially for "Sanitary Engineer" by N. A. Kearns—First Article of Series Appeared in April 1 Issue

IN heating systems where direct radiators are used, much discomfort is, at times, experienced by the children sitting close to where the radiators are installed. This is especially the case on cold windy days when the heating effect of the ventilating system is not great enough to permit the checking of the radiators. Children sitting close to such surfaces are exposed to a condition that should not be allowed. An endeavor to mitigate the evil effects of direct radiation has resulted in the design of screens that may be placed between the radiators and the seats. These screens are made of tin on the side exposed to the radiator and backed with asbestos board and stiffeners. They are attached to the radiators by means of bolts, and to the floors by standards, in such a manner that there is a free air passage of a depth of at least an inch and a half between the screen and the heating surfaces. They may be made by any tinsmith and the cost of the installation is not sufficient to warrant the refusal of a School board in having the work done. Here is an opportunity for aggressive action on the part of those men who are interested in the health of the School population. There are schools where children suffer because of the lack of screens similar to these described, and if this hint should result in the general adoption of the protecting screens where direct radiators are used, we are satisfied that an improved mental activity will follow with those scholars that perhaps in the past have been accused unjustly of stupidity. The installation of the screen will not result in the reduction of the heating efficiency of the radiator.

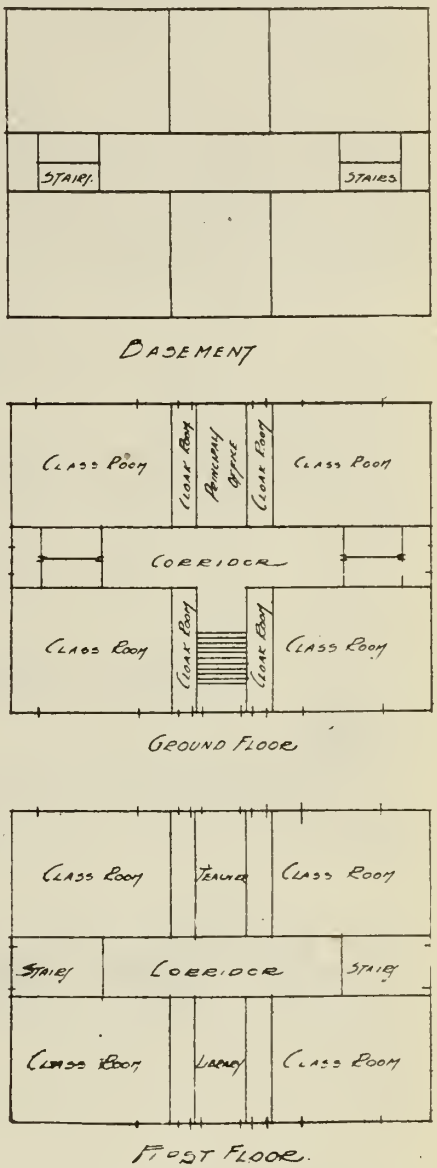
In the fourth article of this series, appearing in the June 1 issue of the SANITARY ENGINEER, a description of a gravity ventilating system for an eight-roomed school building was given. In the system then described the ventilating equipment was distinct from that of the heating. It is now our intention to use the same building in an example of how a ventilating plant may be installed to act also as the heating apparatus.

The storey heights from floor to ceilings are thus:

Basement	10 ft. 6 in.
Ground Floor	12 ft. 6 in.
First Floor	12 ft. 6 in.

All class rooms are 32 feet long and 25 feet wide. The windows are massed along one side of each class room and have an area of about 160 square feet of glass. Each class room is to have a seating capacity for 40 pupils.

In the gravity system of ventilation the flues were to be proportioned so as to deliver 30 cubic feet of fresh air a minute to each occupant of the room. The fresh air was to be delivered to each class room at a temperature never exceeding 72 degrees above zero.



The class rooms were to be warmed by direct radiation placed under the windows and in other exposed locations throughout the building.

The fresh air and foul air flues were to be located in one of the inside walls; just as in systems of fan ventilation with direct radiation heating.

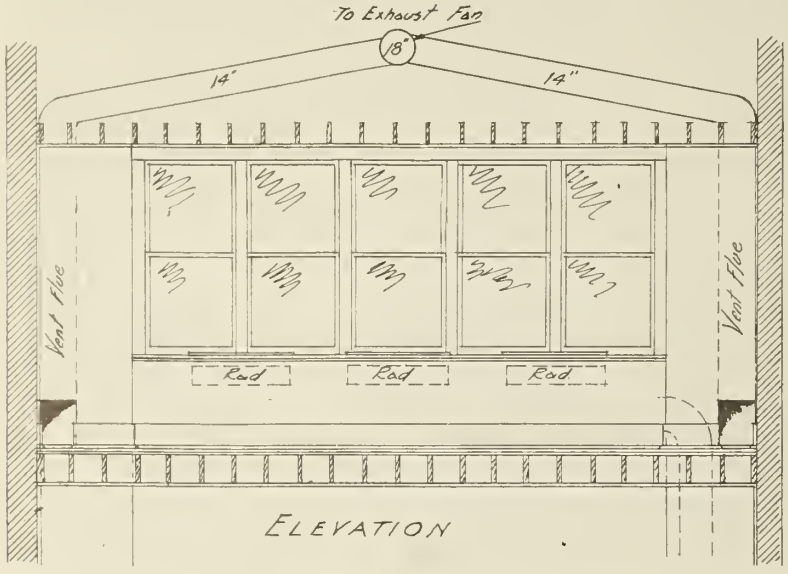
The system that is to be described in this article is an adaptation of the hot blast system and is one that is frequently used in the heating and ventilating of the assembly halls or auditoriums of large school buildings. Although having many merits that should justify its use to a greater extent in class rooms, few

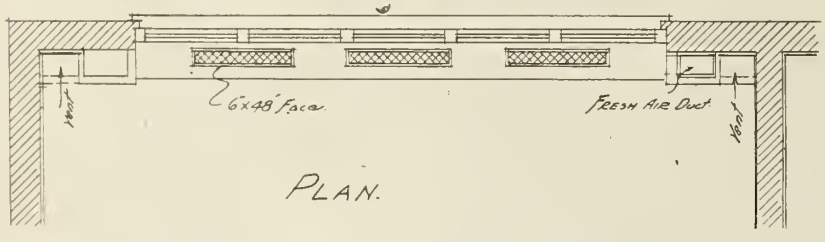
engineers or architects seem to have realized its advantages.

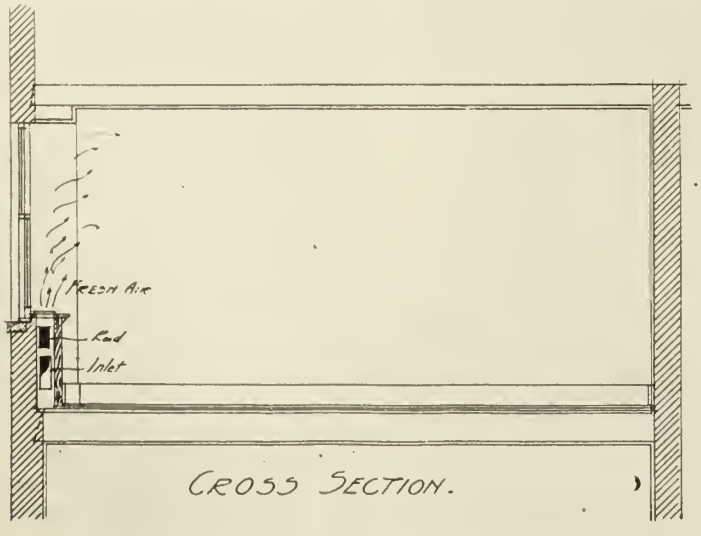
This system of heating and ventilating may have defects that have escaped the author's observation, and it is his earnest desire that some of the fruits of this article may be enough dissenting criticisms to at least clear the atmosphere of biased opinions which the result of a clearer conception of the fundamental laws governing the installation of ventilating systems.

In describing the functions of the system and the application of the details, a great deal of what has already appeared in this series of articles must be repeated. The repetition is necessary because it is our intention to start with the elementary principles of the subject and detail step by step the problems of the design, together with the resulting solutions.

In former articles of this series attention has been directed to certain uncontrollable conditions of nature that at times will nullify the most determined efforts of ventilating engineers to instal systems that should invariably maintain a uniform condition of the air passing through, or contained within, the building. Particular attention is directed to the effects of conflicting air currents, and in the system now described it is to be noted that the fresh air inlet faces are placed in a stragetic position and are not as subject to outer air disturbances as are those of the systems where the pressure of the supply fan is practically exhausted at a considerable distance from and rendered ineffectual by the pressure of the outer atmosphere.







In designing a system of hot blast heating and ventilating for this school we will make use of direct radiators for the heating of all small rooms, corridors, ect. The radiation for the corridors will be proportioned for the usual heat loss, and as no ventilating service for such need be provided we will, in his example, confine our attention to the combined systems that are to be installed in the class rooms.

Now the volume of air required in our former examples was controlled entirely by the standard of air purity desired; but in this example the quantity of air is in ratio to its capacity as a heat carrier.

We must figure the heat loss, and then provide air in the quantities and the temperatures required, not only for ventilation, but also to effect the heat loss occasioned by the cooling surfaces of the rooms and by leakage.

We are to assume that the building is located in a climate where 10 degrees below zero is the coldest winter weather.

We may figure our heat losses thus:

First for leakages: One change of air in an hour is considered a good average standard; but rooms on the north and west of the building will be likely subject to a leakage of slightly more than this, while rooms on the south may be something less. But as one change of air per hour is a fair average we may take that as a basis for our estimate.

The cube of a class room is 10,000 cubic feet. The average temperature of the air within a class room is 68 degrees above zero. We must then provide heat for 10,000 cubic feet of air an hour at a temperature range of the difference between 68 degrees above and 10 degrees below zero.

We divide 10,000 cubic feet of air by the factor 55 to find the equivalent glass surface and we find that we have 180 square feet E. G. S. This 180 multiplied by the temperature range of 78 gives us an answer of 14040 B. t. u. an hour; required for heat loss occasioned by leakage.

Next we estimate the heat loss due to the cooling surface of the exterior walls: There are two walls with a total area of 712½ sq. ft. Deducting the window surface of 160 square feet from this we have an area of 552½ sq. ft. of wall to consider as a cooling surface. For convenience in figuring we will assume that these figures are 553.

As a rule we allow 4 square feet of wall surface as being equivalent to 1 sq. ft. of glass; but in this example we will refer back to the chart given in the SANITARY ENGINEER of July 1 and find that the 16 in. brick wall, as we have it here—is equivalent to 27 per cent. of a like area of glass. But the brick wall in the school has an air space of one inch and a lining of lath and plaster; so we must allow for this heat insulation value when estimating the heat loss resulting here. We may consider that the insulation value of 1 in. of lath and plaster on

wall furring will be enough to allow the discounting of at least 30 per cent. from the heat loss through the plain brick wall; so we consider that the 16 in. brick wall, furred and plastered as specified, is equivalent to 19% of a like area of glass.

Therefore the 553 ft. of wall is now to be considered as 105 square feet of glass. The heat loss through this is found by multiplying the 105 square feet of glass by the temperature range of 78 degrees, which gives us a heat loss of 8190 B. T. U. an hour.

The heat loss through the window is found by multiplying the glass area by the temperature range, thus: 160 x 78 = 13,400 B. t. u. n an hour.

The total heat loss found so far is:

Leakage	14,040 B. t. u.
Wall surface	8,190 B. t. u.
Glass	13,400 B. t. u.
	35,630 B. t. u. an hour

There should be added to this heat loss, already found, the loss due to ventilation. The method of figuring for this was given in the article appearing in the SANITARY ENGINEER of June 1, and it was here indicated that 113,520 B. t. u. were required an hour to heat the quantity of air for the ventilation of the room. Remember that these figures for ventilation are based on the number of occupants of the room, and not in the ratio to the size of the room.

It will be noted that there is a great deal more heat required to ventilate than to keep the rooms warm; and when we come to figure the air required to carry the heat to the room, we may find that the air required by ventilation is something in excess of, or less than, the air required for carrying the heat to the room.

The volume of air required as a heat carrier is governed by the differences of temperature of the incoming and outgoing air. The difference is known as the "temperature drop."

Where the air is driven into the rooms at some distance from the cooling surface of the windows, etc., the initial temperature of the air must be higher than that when the air is driven directly in front of these surfaces as in the example here given.

If the warm air is driven into the room on the inside walls, the temperature of the incoming air must be at times as high as 120 degrees above zero, whereas when the heat is blown directly up in front of the windows, a temperature of more than 90 degrees above zero will never be required, and, as a rule, a temperature of 80 degrees will be quite enough for the most rigorous weather conditions.

We will consider that the entering temperature of the air is to be 85 degrees and that it is to drop to 60 degrees at the vent outlets. Air dropping thus gives off about .452 of a B. t. u. in an hour per cubic foot, and as the heat loss, without regard to the ventilation, is 35630 B. t. u. we find that we require (when we divide the heat loss in neat units by the quantity of heat given off by the air) an air supply of about 78827 cubic feet per hour.

The quantity of air required for heating is thus a little more than the air required for ventilation. By raising the temperature of the incoming air we could reduce the quantity of air required as a heat carrier.

Our next step is to arrange the heating surfaces etc., for heating the air. We might place all of the heating surfaces in one stack in the basement and then heat the incoming air to the temperatures required, then driving it through a series of ducts to the fresh air openings in the rooms. But in doing so we would not have the flexible temperature control that is one of the merits of the system illustrated in this article.

The fresh air that is drawn in from out of doors is to be heated to a temperature of 50 degrees in the basement, and to be there humidified and otherwise prepared for the auxillary heaters placed within the fresh air ducts at their class room openings.

Eight class rooms are indicated on the drawings and as each class room requires 78827 cubic feet of air per hour we muct specify a supply fan capable of delivering 10510 cubic feet of air per minute.

It is the intention to first heat the air, at the primary heaters in the basement, to a temperature of 40 degrees; then passing it through an air washer where it is saturated with water vapour. The air will then pass through the secondary heater where it will be heated to a temperature of 60 degrees above zero. From the secondary heaters the air travels through galvanized iron ducts, or ducts of other materials, to the heaters at the class rooms. The air will be finally heated to the temperature required to keep the room at the uniform temperature of 68 degrees above zero.

If the wind is blowing coldly from the north-east, the radiators on that side of the building will be working full blast to take care of the additional heat required there, while those in the warmer parts of the building will be automatically checked because of the little heat required at that delivery. The variation of the heating demands will in no way affect the constant even flow of air through the rooms. The air temperature is set at 60 degrees above zero, and if because of contrary winds, a part of he air travelling in certain channels becomes low in temperature it will be heated before it enters the room.

The direction taken by the fresh air in passing from inlet to outlet registers in class rooms is the same during warm weather as during cold. This can be understood by the reference to the illustration.

As the arrangement of fans, heaters, air washers, re-heaters, etc., is practically the same as that of the ordinary plenum system of ventilating we will not now attempt to describe this part of the apparatus, but will take up our problem at the point where the air is travelling through the ducts in the basement at a temperature ranging from 50 to 60 degrees above zero, and at a velocity of 1,000 feet a minute.

We must decide on the area required in the final heaters, and we go about it in this way:

The temperature of the air when it reaches the final heaters is somewhere between 50 and 60 degrees above zero. We will say 55 degrees, and as it is to be raised to a temperature of 85 degrees, the mean temperature is 70 degrees. One B. t. u. will raise the temperature of 55 cubic feet of air 1 degree at this temperature, so we divide 78827 cubic feet of air by 55, multiplying the result by the 30 degrees difference required and find that we should provide heating surface equal to supplying 42990 B. t. u.

"But hold on!" some one says: "How about the heating surface required for the loss due to ventilation?" So we must go back for a while over some of our figures to show how this has been provided.

You will remember that the loss of heat in the ventilation was figured at 113,520 B. t. u.

Well, we now have an air supply of 78,827 cubic feet an hour raised from 10 degrees below zero to 60 degrees above. In raising the temperature of the air to this point 116,050 B. t. u. were added to the air. This is a good deal in excess of the quantity required to offset the heat loss of ventilation.

The area of radiating surfaces required in the final heaters will be governed by the condition of setting. Pipe coils might be used in place of the cast iron sections shown, but for convenience we are to consider the heaters here made up of extended surface cast iron radiators of the same type as those used in the primary and secondary heating chambers.

The current of air to which the final heaters are exposed moves at a speed of about 600 feet a minute, and as the mean temperature of that air is about 70° each square foot of radiation should give up approximately 1107 B. t. u. in one hour. Thus we require about 40 square feet of heating surface here. We will therefore use three sections of 50 in. Veno radiators totalling 40½ square feet of radiation.

The fresh air outlets are to be proportioned so that the speed of the escaping air may be kept down to 300 linear feet a minute. This low velocity is not dedetermined because of the danger of draughts; but rather as an aid in establishing a uniform rate of air flow around the radiators that set immediately below these faces. The area of the faces required is that found by dividing 300 (the air velocity) by 1314 (the air volume)—4.3 square feet. As only about 2/3 of the face area can be considered as

a free air-way we should consider that the faces required must have an area of 6 square feet.

When we start to design the foul air outlets we must remember that these must be proportioned so that there will be no draughts caused by having these outlets too small. The outlets are at the floor line, and as there must be sufficient area to carry 1230 cubic feet of foul air away every minute, and as these outlets must not be proportioned for a velocity of more than 200 feet per minute we find that the vent opening should have an area of at least 6 square feet. We will provide two openings as shown on the plan and make the area of each opening 3 square feet. There is no reason for faces on these openings so we will leave the openings uncovered. The back of the vent flues are to be plastered and the flooring and base boards returned around the re-entering angles by the carpenter.

The foul air flues must not be unduly small in proportion to their inlets as otherwise the high velocity of the air passing through the flue will result only in the upper part of the inlets being used as exhausts. The velocity in these flues is to be figured at 400 feet a minute.

An exhaust fan should be used in a system of this kind, as the exposure of the backs of the vent flues to the outer walls will have the effect of preventing any upward air travel due to temperature head. Of course the backs of these flues may be insulated from the cold, by the building in of dead air pipes, etc., but the extra cost of construction will go a long way in paying for an exhaust fan.

The pipe to the exhaust fan may be figured for a velocity of 800 feet a minute.

This system cannot be considered as complete without automatic temperature control.

Needless to say that it is necessary to provide doors for easy access to all parts of the ventilating system so that it may always be kept clean.

It will be necessary to set equalizing dampers to regulate the flow of air in different directions. These are details not shown; but details that can easily be designed by anyone having the data given in this and in previous articles of the series.

The drawing of the cross section indicates how the cold air leaking through and around the windows becomes mixed with the warmer air and does not pour in a cold stream down on the heads of the pupils.

A system like this could hardly be used without the fans. The location of the radiators would work against any considerable air circulation by the effect of gravity alone.

It would be an easy matter to connect the vent flues to a common gathering chamber from whence the air could be returned to the fan and to the heater in the basement, thus providing for the rotation of air during the time that the building was unoccupied. A cheaper, but less effective, way of providing for this rotation would be to have an opening left in the centre of the corridor. This opening being connected to the fan room. When a room is unoccupied the dampers in the vent flues are closed and the door of the class room is left open, thus the air will travel from the class room through the corridors, to the large opening, and from thence to the heater chamber in the basement.

SAVING FUEL IN HEATING A HOUSE

Continued from page 23

are intelligently anticipated, as they ordinarily can be, the house can be warmed with minimum trouble and fuel. When the rooms become too warm the fire should be checked by stopping the admission of air under the grate and decreasing the draft by opening the "check damper." If, as often is done, the ash-pit damper or the ash-pit door be allowed to remain open and the draft reduced by opening the fire door, the combustion of the fuel continues, although at a slower rate, but the cold air entering the fire door chills the heater so that little heat is realized from the coal.

Sometimes the draft is so strong that the difficulty of controlling the fire is increased, especially when the demand for heat is small or the fire is to be banked. To facilitate control under such conditions it is usually advisable to have, besides the check damper, a plain damper in the smoke pipe. This damper should fit the smoke pipe loosely and must never be entirely closed; during most of the heating season it can be kept partly closed, but during severe weather, when more heat is required, it can be opened wide. Sometimes the draft may be insufficient to burn the necessary quantity of the particular fuel used. If such a condition is always noticed in severe weather, the heater may be too small, the smoke pipe may be choked or be poorly fitted to the heater or to the chimney, or the chimney may be too small or be obstructed by soot or debris. As to the size of smoke pipe and chimney, one authority says that the cross-sectional area of the smoke pipe should be one-eighth of the grate area, that the diameter of a round chimney should be 2 inches more than that of the smoke pipe, and that if the chimney be square the inside length of the side should be 1½ inches more than the diameter of the smoke pipe.

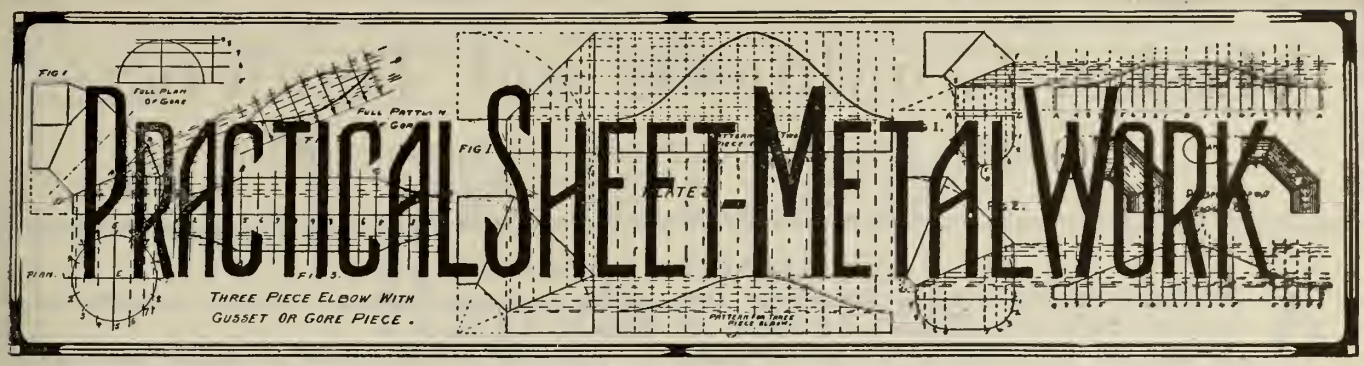
If the draft trouble proves to be due to leaky connections or to obstructions it can readily be corrected. If the heater or the chimney be too small the difficulties may be lessened either by firing more frequently and keeping the fuel bed thinner, or by using larger coal, of fairly uniform size, in order that the air may more easily flow through the fuel bed. Conversely, if the draft is very strong a smaller size of coal may possibly be used to good advantage.

To burn a pound of coal requires much more than a pound of air, and the volume of a pound of air at atmospheric pressure is far greater than that of a pound of coal. To burn more coal requires more air, and this air must be forced into the ash pit and up through the fuel bed by the difference between the pressure of the hot air and gases over the fire pot and that of the air entering the ash pit—in other words, by the "draft." This difference in pressure may be affected by various causes, some of which have been mentioned, but depends largely on the height of the chimney, which in turn is determined in a measure by the general design of the house. Under no circumstances should the top of the chimney be lower than the highest part of the roof, or a current of air may be forced down the chimney and the basement be filled with smoke when the wind blows in certain directions. Similar trouble may be experienced if the chimney is not as high as an adjoining building.

Removal of Ashes

Usually the most disagreeable feature of tending house-heating apparatus is the removal of the ashes, and the possibility of facilitating the handling of ashes should receive attention when a heater is installed. If the bottom of the ash pit is on a level with the floor or only a short distance below the grates, as is ordinarily the case, ashes can not be allowed to accumulate under the grates for more than two days, or possibly more than one day, except in moderate weather, and must either be carried from the basement then or stored there and removed later. In any case the ashes must be shoveled at least once with the consequent scattering of dust. Some heaters are now set with a recess under the base, this recess holding a can into which the ashes drop directly. The recess must be so constructed as to permit easy removal of the can and to prevent leakage of air through the base and the fuel bed when the fire is to be banked or checked.

(To be continued)



By THOMAS STANFIELD

THIS is the season of the year when hardwaremen with tinsmithing and heating departments should begin to look forward to the fall trade. Evidence of this is already to hand by an inquiry as to the way to make a ventilator for chimney top. The method of making a ventilator has previously been described in SANITARY ENGINEER, but for the benefit of those who may be interested again the process is again described.

The accompanying illustration, Fig. 1, describes a type of ventilator which appears at first glance to be a common one. Many sheet metal workers simply make this top with pieces A, C and D, but such tops are little better than ornaments, except that piece A serves as a cover to the pipe D.

The top described in Fig. 1 is known as an improved Emerson ventilator, the old and original Emerson top was fitted with a flat top, which took the place of the solid cone A, B. It will be noted that the two slanted surfaces B, C will deflect the wind from whatever direction it blows, so as to form a horizontal current of air over the top of the open end of pipe D and not only will this top give satisfaction as a ventilator, but also as a chimney top, too.

The first step to take when developing pattern for such a piece of work is to draw the elevation Fig. 1. The size of cone A, B and flared piece C should be about two-thirds the diameter of the pipe and the cone should have a depth from upper and lower point of about one-quarter its own diameter. Piece C should be flared at a little over twice that of the cone. The perspective view, Fig. 4, shows a fairly well balanced design, which is not only effective, but looks well proportioned.

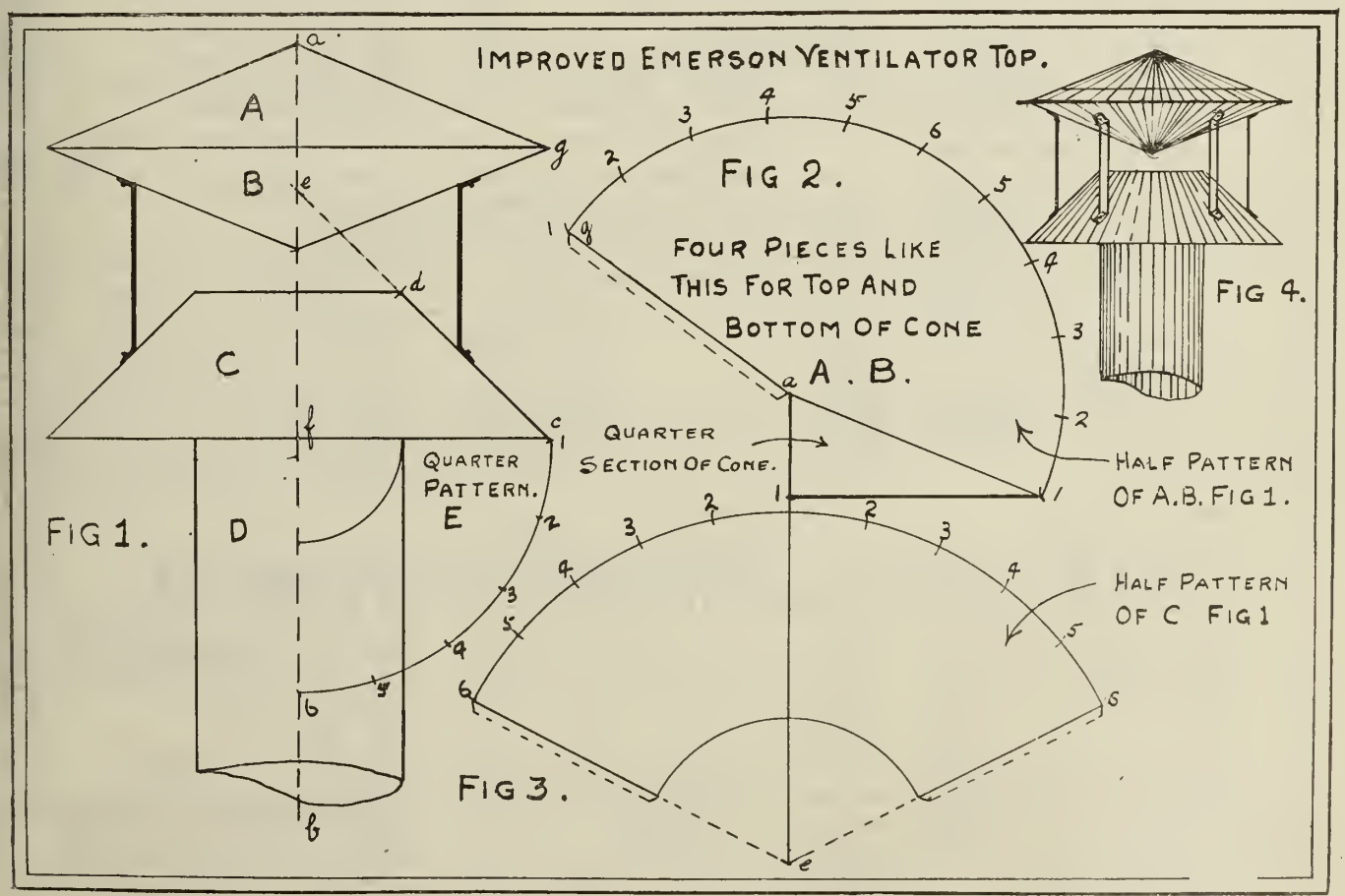
Having drawn the elevation on the centre line a, b extend the slant line c, d to e on a, b as shown at d, e and with e as centre draw a circle, Fig. 3, which is the half pattern of piece C.

Next place the compass as f and draw two arcs from c to dotted line a, b and divide this arc into five equal parts, 1, 2, 3, 4, 5, 6, and transfer same to arc in Fig. 3, and repeat, beginning with 6 to 1, and 1 to 6. Then by using e on Fig. 1 as centre and d as radius, the half pattern of C is completed except that allowance for locks and seams must be made.

To develop the cone requires two full pattern pieces, one should be at least one-quarter of an inch larger all round to allow for seam.

Place point of compass at a, and with g as radius draw an arc as shown in Fig.

Continued on page 29



Market Conditions and Tendencies

Statements Regarding Supplies and Trend of Prices

THE MARKETS AT A GLANCE

A NUMBER of important changes in the markets have been made. As stated in the last issue of SANITARY ENGINEER, pipe fittings are higher, the new quotations being ten per cent. above former figures. An advance of five per cent. has been made on all lines of enamelware. Malleable fittings are quoted at approximately 12 per cent. above former prices.

New prices on brass goods show an advance of approximately fifteen per cent. Prices on some lines are not yet worked out, but it is stated that the new prices will be about the figure stated.

The cheaper grade of oakum has advanced slightly. No change has been made in prices of waste.

In the ingot metals the only change is in tin which is slightly easier. Copper remains very firm.

The shortage of goods which has been mentioned in previous issues of SANITARY ENGINEER is even more acute in many lines and the delay in obtaining much needed equipment is creating complaints which affect and annoy everyone in the trade. Many plumbers are being held up because they are unable to get soil pipe, fittings or other necessaries.

There is every indication that the general activity which has developed in building will continue throughout the season and that there will be a steady and excellent demand for goods. While the labor troubles are not all settled, the outlook is much more satisfactory than it was a short time ago. The effects, however, will be felt for some little time as depleted stocks cannot be replaced at a moment's notice.

TORONTO, August 29.—"Business is good," is the general opinion expressed by those in the trade. Most of them add that their principal trouble is to get enough goods to keep up with the orders that are coming in. It is an impossibility to get anything like sufficient supplies in many lines and as a result a great deal of work is being delayed. Manufacturers are looking for continued activity in building. Many of them have enough orders on hand now to keep them working steadily all the rest of the season, and inquiries which are coming indicate that there will be a lot of work get under way in the spring. While a large number of dwellings have been erected, the scarcity of housing accommodation seems to be practically as acute as ever, especially in the larger centres. From the country districts come reports of splendid prosperity, and inquiries from many farmers who are planning to put modern improvements in their homes, instal water systems and so on. Taken altogether the outlook for good business is bright.

Enamelware Prices Advance 5 Per Cent.

ENAMELWARE.—A five per cent. advance on all lines of enamelware has gone into effect. Slow deliveries of goods continue to cause inconvenience to those in the trade. Business has been good and prospects are that it will continue so throughout the year. Building permits continue to show a substantial growth and as there is a large percentage of residences of a good class being built there is a steady call for enamelware goods. Quotations on some of the well-known lines are as follows:

Bath tubs, rill rim, 4, 4½, 5 feet, 24 to 30 in. wide	$37 07
Bath tubs, 5½ ft.	41 27
Lavatories—	
17x10" Apron F139 or P4045	11 00
18x24" Apron F154 or P3845 or P3847	17 00
18x21" Apron F169 or P4205	12 70
18x21" Roll rim F197, F199 or P4655-6	11 10
17x19" Roll rim F241 or P4345	9.05
Sinks, roll rim, 18 x 30 in.	16 60
Sinks, flat rim, 20 x 30	6.77-6.65
Do., 18 x 30	6.07-6.19
Do., 16 x 24	5.29-5.45
Closets, oak tank and seat	26 50
Do., enamel iron or white vitro tank	30 00

Range Boiler Prices Remain Unchanged

RANGE BOILERS.—Prices of range boilers show no changes. Business has been good and with continued activity in building there is every prospect that it will remain so. Quotations are as follows:

Range Boilers	Standard	Extra Heavy
30-gallon	$11 00	$12 50
35-gallon	13 50	15 50
40-gallon	15 25	17 25
52-gallon	20 50	25 00
66-gallon	32 00	38 00
82-gallon	40 00	47 00
100-gallon	50 00	58 00
120-gallon	60 00	67 00

Soil Pipe Scarce; Fittings Are Higher

SOIL PIPE, FITTINGS.—Deliveries of soil pipe have been very slow and as a result there is a good deal of complaining. Many firms have been unable to obtain anything like the amount they require, and the best they can get is promises.

New prices are out on both pipe fittings and malleable fittings, and show advances of approximately ten to twelve per cent. The new figures are shown below:

Medium and extra heavy soil pipe, 2, 3 5 and 6 in.	10%
Medium and extra heavy soil pipe, 4 in..	15%
Medium and extra heavy soil pipe fittings, 2 in. to 6 in.	25%
8 in. extra heavy pipe and fittings	5%

PIPE FITTINGS

Cast iron fittings	10%
Plugs	22%
Bushings	25%
Unions, ¼" to 2½"	40%
Do., ⅛", 3" and larger	35%
Dart unions, ¼-inch to 2-inch	25%
Do., 2½-inch and larger	15%
Nipples, up to 4-inch	80%
Do., 4½-inch and larger	70%
Do., running thread 4-in. and under	50%
Couplings, 4-in. and under	40%
Do., 4½-in. and larger	20%

MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittings, Class A, lb.	$0 57	$0 72
Do., Class B, lb. net	0 25	0 35
Do., Class C, lb. net	0 19	0 25

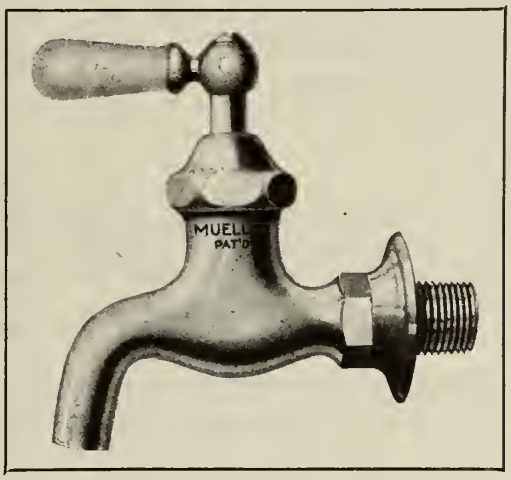
Many Advances Shown In Price of Brass Goods

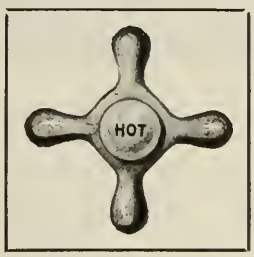
BRASS STEAM GOODS.—A number of price changes, all to higher levels, have been made. Business has been good and as stocks of many lines have been steadily going down with little replacement owing to labor troubles, deliveries are often somewhat slow. There is fair activity in marine goods. Quotations are as follows:

Compression work, standard	35
Fuller work, standard	40
Bath cocks, compression	37
Bath cocks, Fuller	40
Flatway stop and waste cocks, standard	38
Roundway stop and waste cocks, standard	38
Brass steam cocks, standard	Net List
Globe, angle and check valves, standard.	5-23%
Do., removable disc	10-22%
Radiator valves, standard	15%
Do., removable disc	Net List
Basin Cocks—	
No. 0 and 1, Fuller pattern	40
Compression	30
Quick opening	40
Globe, angle and check valves, standard, medium pressure	5-23%
Radiator valves, standard med. pressure	31%
Radiator valves, removable seat, medium pressure	25

MADE IN CANADA

MUELLER
Rapidac Bibbs





**A 2231, Plain Spout
With Hexagon, Solid Flange Outside
Thread**

The **MUELLER** Rapidac Bibb A 2231 pictured above is but one design out of a complete line embodying many new and exclusive features.

The anti-spreading feature, contained in this and other **MUELLER** bibbs, is cast as an integral part of the bibb. This device breaks up the whirling motion of the water and delivers it from the spout in a smooth, solid stream.

Built in every **MUELLER** Bibb is the superior mechanical construction perfected in sixty years' brass foundry experience.

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Oakum is Higher; Waste Unchanged

WASTE, OAKUM.—An advance is shown in the cheaper grades of oakum and quotations on plumber's spun now range from $9.50 to $10.00 per hundred pounds. The other grades remain steady. No change is shown in the prices of waste. Quotations are as follows:

	Per 100 lbs.	
Best American	$21 00	$22 00
Clipper, spun	.....	21 00
Do., unspun	.....	10 50
Plumbers' spun	9 50	10 00

Firm Market Prevails On Wrought Pipe

WROUGHT PIPE.—Strength is prominent in the feeling on wrought pipe. Higher prices are being talked of and seem due to come almost any time. Difficulty in getting sufficient skelp to meet needs of production is being experienced and with trade good, it is indicated that it is not easy to take care of business offering.

Boiler Tubes Hold Firm; Unchanged

BOILER TUBES.—Boiler tubes rule with a firm undertone, but show no actual change from prices given below:

BOILER TUBES—	Seamless	Lapweld
1¼ inch	$27 00	$.....
1½ inch	28 00	.....
1¾ inch	30 00	26 00
2 inch	30 00	26 00
2¼ inch	33 00	28 00
2½ inch	40 00	32 00
3 inch	46 00	38 00
3¼ inch	.....	45 00
3½ inch	56 00	42 00
4 inch	70 00	54 00

Galvanized Sheets Register Advance

SHEETS, PLATES.—An advance of 20c per 100 pounds is reported in some quarters on galvanized sheets, and the tendency of the market all through seems upward. Warehouses are buying quite heavily in some cases, although in others they have not cleared out the large war stock that was being carried. One of the dealers stated this morning: "We are buying heavily now, because we confidently expect that prices are going up to a higher level than they are at present. There are labor troubles of several kinds on the horizon in the steel mill district, and these, along with other tendencies, are going to keep prices up. We regard it as a good policy on our part to buy enough now to put us in good shape for some weeks and months to come.

Business locally is coming along quite freely and warehouse shipments are going forward in good shape. Range of prices to-day follows:

14 gauge	4 85	5 10
16 gauge	4 95	5 20
18-20 gauge	5 80	....
22-24 gauge	5 85	....
26 gauge	5 90	....
28 gauge	6 00	....
3-16 inch plate	4 90	6 25
¼-inch boiler plate	4 50	5 80

Prices shown are for full cases. An extra charge of from 25c per 100 lbs. is made for less than case lots.

GALVANIZED SHEETS.

10¾ oz.	$7 80	$8 00	$8 10
U.S. 28	7 40	7 60	7 70
U.S. 26	7 10	7 30	7 40
22 and 24	6 95	7 15	7 25
18 and 20	6 80	7 00	7 10
16	6 65	6 85	6 95
12 and 14	6 50	6 70	6 80

An extra is now charged on galvanized sheets, 10¾ oz. and 28 ga., when shipped out in sheets 3 feet wide. The extra charged over prices shown above is 20c per 100 pounds. Other gauges show no change for different widths.

Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

Better Movement of Lead Products Noted

LEAD AND ZINC PRODUCTS.—A distinct improvement in amount of business being handled is reported, and outlook seems to be for a continuation of this condition. Prices are well maintained, and without change at following levels:

Doubt Shows Up In Scrap Metal Circles

OLD MATERIALS.—A feeling of doubt exists in the minds of some of the large dealers in scrap metals as to what the next move is going to be. There seems to be an impression that there is some manipulation going on in the larger consuming and buying centres, and until this is dispelled it is likely that there will be a tendency on the part of some of the larger dealers in Canada to sit tight. It may be that there will be a slight dip in values, but it is hard to see where it can last for any length of time. It is claimed by several that though coppers and steel have reached their peak for some time at least, and that they are not due for much higher figures. However, there is no feeling that they will travel far in the opposite direction. Some of the smaller sellers feel that right now is a good time to sell their material, and they are still letting it go, particularly as the buyers here and in Montreal are standing behind the prices that have been ruling for some weeks past, and it hardly seems likely, unless something unforeseen happens, that there will be any reduction in buying values.

Little Change Made In Ingot Metals

INGOT METALS.—An easier price has been made on tin in some quarters, but apart from that, little change has been made. Business generally is very fair.

COPPER.—The market is holding its own, and seems somewhat stronger, although no actual price change has occurred here. The price rules at 27c per pound.

TIN.—A decline has been recorded in some quarters on tin, making quotations read from 58c to 61c per pound. Stocks are very fair and demand satisfactory.

SPELTER.—A somewhat better demand is reported in this metal, which has had a tendency to strengthen the market. No actual change is reported, however, the price ranging around 10c per pound.

LEAD.—Sales are very good, and the market seems quite steady, with firmness showing. Prices here range about 7c per pound, an unchanged figure.

ANTIMONY.—Trade is along fairly well regulated lines with sales considered satisfactory, and prices firm at about 10c to 10¼c per pound.

ALUMINUM.—There is nothing startling in this metal, which is moving out in somewhat better volume at around 35c per pound, an unchanged figure.

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THE GURNEY FOUNDRY CO. LIMITED
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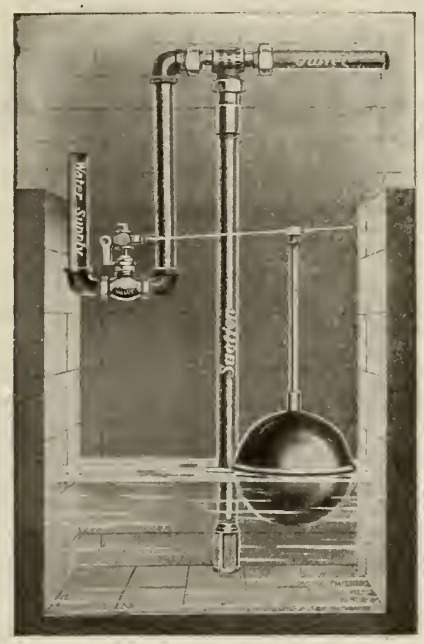
HAMILTON STOVE AND HEATER COMPANY LIMITED.
HAMILTON CANADA.

Save Your Customers

Loss and Damage

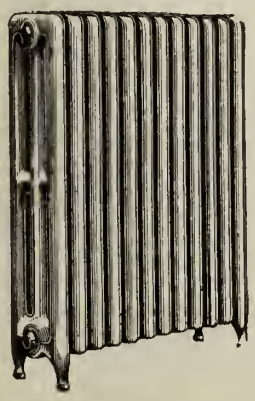


The Morrison Automatic Cellar Drainer will keep cellars dry in the Spring, or any other time. The cost of the Morrison Drainer is soon paid for by the saving in stock previously damaged or deteriorating in value in damp storage space.

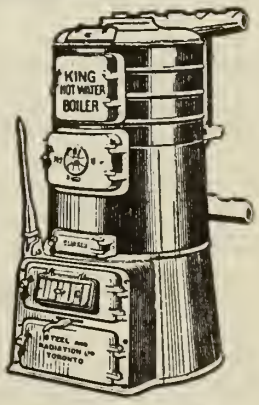
The Morrison operates entirely automatically at 10 lbs. or higher water pressure. Simple—nothing to get out of order. It's money for you whether you sell it or use it yourself.

The James Morrison Brass Mfg. Co., Ltd.
93-97 Adelaide St. W., Toronto, Ont.

KING HOT WATER BOILERS AND IMPERIAL RADIATORS



The Perfect Heating System



By all the tests to which a heating system can be subjected, the King Hot Water System makes a record of almost one hundred per cent. The scientific construction of the water channels; the arrangement of the fire chamber and flues; the quickness with which heat is taken up by the water, lessening the amount of fuel required; the airtight joints, preventing waste of fuel by ungovernable drafts; the strength of the materials; the convenience of all parts; the ease of shaking and ash disposal; the dust-tight ash pan, and other points are reasons why you should install King Hot Water Systems.

"The System that Gives Satisfaction"

STEEL AND RADIATION, LIMITED

Manufacturers of Hot Water *and* Steam Boilers *and* Radiators; Fenestra Steel Sash *and* Concrete Reinforcing

Classified Buyers Guide

AIR RECEIVERS
Wm. B. Scaife & Sons Co., Oakmont, Pa.

AIR LINE SYSTEMS
C. A. Dunham Co., Ltd., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

AIR VALVES
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Beaton & Corbin Mfg. Co., Southington, Conn.
Canadian Wolverine Co., Ltd., Chatham.
C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.
United Brassfounders and Engineers, Ltd., Cornbrook, Manchester, England.
Wallaceburg Brass & Iron Mfg. Co., Ltd., Wallaceburg, Ont.

ASBESTOS GOODS
James Morrison Brass Mfg. Co., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

BOILERS, STEAM OR HOT WATER
Gurney Foundry Co., Limited, Toronto.
Wm. B. Scaife & Sons Co., Oakmont, Pa.
Lord & Burnham Co., Ltd., Toronto.
Modern Heating & Eng. Co., Ltd., Montreal.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.

BOILER FEED REGULATORS
Empire Mfg. Co., London and Toronto.
C. A. Dunham Co., Ltd., Toronto.
James Morrison Brass Mfg. Co., Toronto.

BOILER FITTINGS
Fittings Limited, Oshawa.

BOILER STANDS
Fittings Limited, Oshawa.

BOLTS, EYE
J. H. Williams & Co., Brooklyn, N.Y.

BRASS GOODS, VALVES, ETC.
Joseph Breeden & Co., Ltd., Birmingham, Eng.
Canadian Brass Co., Ltd., Galt, Ont.
Canadian Wolverine Co., Ltd., Chatham.
C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Limited, Galt.
G. & W. G. Gummer Ltd., Rotherdam, Eng.
Kerr Engine Co., Ltd., Walkerville.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.
Wallaceburg Brass & Iron Mfg. Co., Ltd., Wallaceburg, Ont.

BRASS PIPE AND TUBE
Canada Metal Co., Ltd., Toronto.
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

CELLAR DRAINERS
Galt Brass Co., Limited, Galt.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

CHAIN WRENCHES
Trimont Mfg. Co., Roxbury, Mass.
J. H. Williams Co., Brooklyn, New York.

CLAMPS "C"
J. H. Williams & Co., Brooklyn, N.Y.

CLOSETS
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Limited, Galt.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Standard Sanitary Mfg. Co., Ltd., Toronto.
United Brass & Lead, Ltd., Toronto.

COUNTRY RESIDENCE EQUIPMENTS
Empire Mfg. Co., Ltd., London and Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

DAMPER REGULATORS
C. A. Dunham Co., Ltd., Toronto.

DRAINAGE FITTINGS
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Fittings Limited, Oshawa.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.
United Brassfounders and Engineers, Ltd., Cornbrook, Manchester, England.
Warden King, Ltd., Montreal.

DRINKING FOUNTAINS
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

DROP FORGINGS
J. H. Williams & Co., Brooklyn, N.Y.

EJECTORS, STEAM
Kerr Engine Co., Walkerville.
James Morrison Brass Mfg. Co., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

ENAMELWARE
Amherst Foundry Co., Ltd., Amherst, N.S.
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Limited, Galt.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Port Hope Sanitary Mfg. Co., Ltd., Port Hope.
Standard Sanitary Mfg. Co., Ltd., Toronto.

ENGINEERS
Modern Heating & Eng. Co., Ltd., Montreal.

ELECTRIC PUMPING MACHINERY
Empire Mfg. Co., Ltd., London and Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

EXPANSION TANKS
Wm. B. Scaife & Sons Co., Oakmont, Pa.
Toronto Hardware Mfg. Co., Ltd., Toronto.

FUEL SAVING DEVICES
Modern Heating & Eng. Co., Ltd., Montreal.

FITTINGS
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Fittings Limited, Oshawa.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

FITTINGS, CAST IRON, SCREWED, FLANGED, DRAINAGE AND MALLEABLE, SCREWED
Fittings Limited, Oshawa.

FILTERS (WATER)
Wm. B. Scaife & Sons Co., Oakmont, Pa.

FLUSHOMETERS
Canada Metal Co., Ltd., Toronto.
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Ltd., Galt.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Standard Sanitary Mfg. Co., Ltd., Toronto.

FLOOR AND CEILING PLATES
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Beaton & Corbin Mfg. Co., Southington, Conn.
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., London and Toronto.
Fittings Limited, Oshawa.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
James Morrison Brass Mfg. Co., Toronto.

FURNACES
Gurney Foundry Co., Limited, Toronto.
Steel & Radiation, Ltd., Toronto.

GAS APPLIANCES
Consumers' Gas Co., Toronto.

GASOLINE ENGINES
Empire Mfg. Co., Ltd., London and Toronto.

GAS WATER HEATERS
Consumers' Gas Co., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

GLOVES, WORKING
R. G. Long & Co., Toronto.

GRATES FOR RANGES, FURNACES AND BOILERS
McIntyre & Taylor, Toronto.

GREY IRON CASTINGS
Fittings Limited, Oshawa.

HEAT GENERATORS
Galt Brass Co., Galt, Ont.
James Morrison Brass Mfg. Co., Toronto.

HEATING APPARATUS
C. A. Dunham Co., Ltd., Toronto.
Modern Heating & Eng. Co., Ltd., Montreal

HEATERS
Lord & Burnham Co., Ltd., Toronto.
Modern Heating & Eng. Co., Ltd., Montreal.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal and Toronto.

HEATING SYSTEMS
C. A. Dunham Co., Ltd., Toronto.
Modern Heating & Eng. Co., Ltd., Montreal.

HOIST HOOKS
J. H. Williams & Co., Brooklyn, N.Y.

HOT WATER COILS, DOMESTIC
McIntyre & Taylor, Toronto.

KNITTED GOODS, WORKING
R. G. Long & Co., Toronto.

LEAD
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Hoyt Metal Co., Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

MACHINISTS' TOOLS
J. H. Williams & Co., Brooklyn, N.Y.

MALLEABLE IRON CASTINGS
Gurney Foundry Co., Limited, Toronto.
Fittings Limited, Oshawa.

MIXING VALVES
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Port Hope Sanitary Mfg. Co., Ltd., Port Hope.

MONKEY WRENCHES
G. & W. G. Gummer, Ltd., Rotherham, Eng.
Trimont Mfg. Co., Roxbury, Mass.

OVERALLS
R. G. Long & Co., Toronto.

PACKING
Canadian Wolverine Co., Ltd., Chatham.
Canadian H. W. Johns-Manville Co., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.

PACKLESS RADIATOR VALVES
Kerr Engine Co., Walkerville.
C. A. Dunham Co., Ltd., Toronto, Ont.

PIPE AND RADIATOR HANGERS
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Beaton & Corbin Mfg. Co., Southington, Conn.
Fittings Limited, Oshawa.

PIPE, BLACK AND GALVANIZED
Canadian Tube & Iron Co., Ltd., Montreal.
Consumers Metal Co., Ltd.
Empire Mfg. Co., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.

PIPE CLEANSER
Borden Canadian Co., Ltd., Toronto.
Canadian Wolverine Co., Ltd., Chatham.
Chamberlain Desolvo Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Trimont Mfg. Co., Roxbury, Mass.

PIPE JOINT COMPOUNDS
Canadian Wolverine Co., Ltd., Chatham.

Canadian H. W. Johns-Manville Co., Toronto.
James Morrison Brass Mfg. Co., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.

PIPE, SOIL, AND FITTINGS
Anthes Foundry Co., Toronto and Winnipeg.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Toronto Hardware Mfg. Co., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.
Warden King, Ltd., Montreal.

PIPE THREADING TOOLS AND MACHINERY
Borden Canadian Co., Toronto.
John Hall & Sons, Ltd., Brantford.
A. B. Jardine & Co., Hespeler.
Wells Bros., of Canada, Galt.

PIPE WRENCHES
Borden Canadian Co., Toronto.
Trimont Mfg. Co., Roxbury, Mass.
J. H. Williams Co., Brooklyn, New York.

PLUMBERS' TOOLS
J. H. Williams & Co., Montreal, Que.

PNEUMATIC WATER SUPPLY TANKS
Empire Mfg. Co., London and Toronto.
Wm. B. Scaife & Sons Co., Oakmont, Pa.

PORCELAIN WARE
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
R. MacDougall & Co., Ltd., Galt.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

RADIATOR FOOT RESTS
Beaton & Cadwell Mfg. Co., New Britain, Conn.

RADIATORS
Gurney Foundry Co., Limited, Toronto.
Lord & Burnham Co., Ltd., Toronto.
Steel & Radiation, Ltd., Toronto.
Warden King Ltd., Montreal.

RADIATOR TRAPS (STEAM)
Canadian H. W. Johns-Manville Co., Toronto.
C. A. Dunham Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

RANGE BOILERS
Wm. B. Scaife & Sons Co., Oakmont, Pa.
Toronto Hardware Mfg. Co., Toronto.

REDUCING PRESSURE VALVES
C. A. Dunham Co., Ltd., Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

ROOF FLANGES AND FLASHINGS
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., London and Toronto.

RUBBER GOODS
Canadian Consolidated Rubber Co., Ltd., Montreal.

SASHWEIGHTS (Patent Eye)
Fittings Limited, Oshawa.

SEPTIC TANK VALVES AND SYPHONS
Anthes Foundry Co., Ltd., Toronto.
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James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

SHIRTS, WORKING
R. G. Long & Co., Toronto.

SOCKETS, WIRE ROPE
J. H. Williams & Co., Montreal, Que.

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Canada Metal Co., Ltd., Toronto.
Hoyt Metal Co., Toronto.

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C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Kerr Engine Co., Walkerville, Ont.
James Morrison Brass Mfg. Co., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

STEAM TRAPS
C. A. Dunham Co., Ltd., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

STOVES
Gurney Foundry Co., Limited, Toronto.

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Gurney Foundry Co., Ltd., Toronto.

SMOKE TEST MACHINES
James Morrison Brass Mfg. Co., Toronto.

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Wm. B. Scaife & Sons Co., Oakmont, Pa.

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James Morrison Brass Mfg. Co., Toronto.

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Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Ltd., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
Trimont Mfg. Co., Roxbury, Mass.
Williams, J. H., & Co., Brooklyn, N.Y.

UNIONS
Canada Metal Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Fittings Limited, Oshawa.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

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C. A. Dunham Co., Ltd., Toronto.

VISES, CHAIN, CLAMP, MOUNT
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Galt Brass Co., Ltd., Galt.

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Gurney Foundry Co., Limited, Toronto.

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Did you ever sell a **whistling, noisy Ball Cock?** It didn't advertise you very well, did it? And very likely your customer was not much pleased either.

Next time use Quaturn.

Because, under moderate pressure, they operate quickly, positively and noiselessly.

Because the working parts may be renewed when worn, without taking off the body, and they are interchangeable with all other Quaturn fixtures.

Because they close with the pressure and therefore tend always to close tighter, eliminating leaks.

Because a satisfied customer means more business for you.

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Allpriser Service consists of a flexible leather bound book 7 x 9, of 150 loose-leaf pages. The service includes a list of net prices of all staple articles and a regular service of new sheets revised to the latest changes. Allpriser Service is only $25.00 annually.

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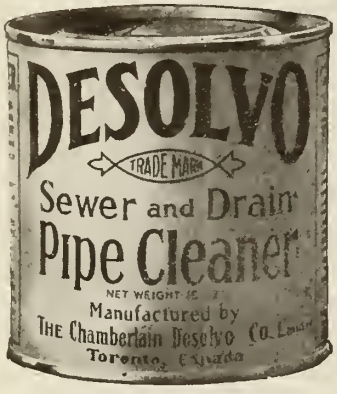

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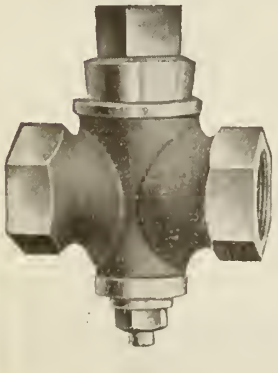
Desolvo has an appeal that makes sales and repeat orders. You can readily see that the housewife will purchase an article that means clearing pipes without tearing up the house, and lawn.
K.K. cleans stains from closets and makes a job easy that was repulsive before.

Order from your jobber.

The Chamberlain Desolvo Co., Limited
110 Church Street, Toronto

Eastern Canada Representatives:
Richardson & Bureau, 55 St. Francis Xavier St., Montreal, Que.



FIVE WORKS---OVER 3,000 EMPLOYEES

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EMPRESS FOUNDRY, CORNBROOK, MANCHESTER, ENG.

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At the commencement of the new era we are pleased to announce that we intend to again direct our energies to the intensive production of:—

GUNMETAL and BRASS VALVES and COCKS.
STEAM, WATER and COMPRESSED AIR FITTINGS GENERALLY.
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SEMI-ROTARY PUMPS.
EXTRUDED BRASS and BRONZE BARS.
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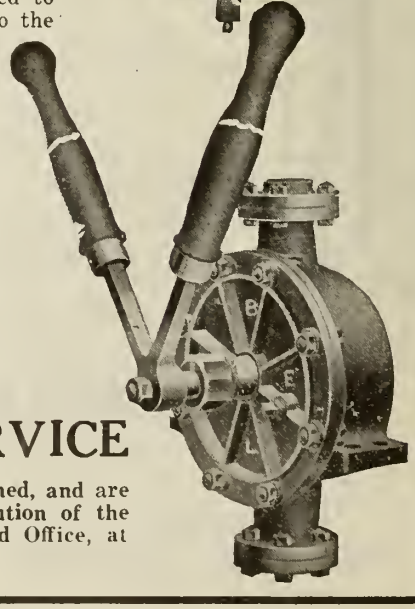
COPPERSMITHS' WORK.
"STELLA" BRAND ALLOYS: MANGANESE COPPER, SILICON COPPER, FERRO ZINC, PHOSPHOR COPPER and TIN, etc.



"UBEL" POST-WAR SERVICE

If you are interested in any or all of the lines mentioned, and are in a position to take a hand in the energetic distribution of the same, please communicate with us NOW to our Head Office, at above address.

The Trade K–T Mark

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FOUNDRY

GALT ONT.

STANDARD

Soil Pipes and Fittings are of pleasing design and good finish. They look good and they **are good**

SPECIALS

Range Boiler Stands are adjustable to 30-35-40 gallon boilers, and you can connect directly under the boiler. Inexpensive but flawless.

Your jobber can supply our goods--if you ask for them

BOB LONG

UNION MADE OVERALLS SHIRTS & GLOVES

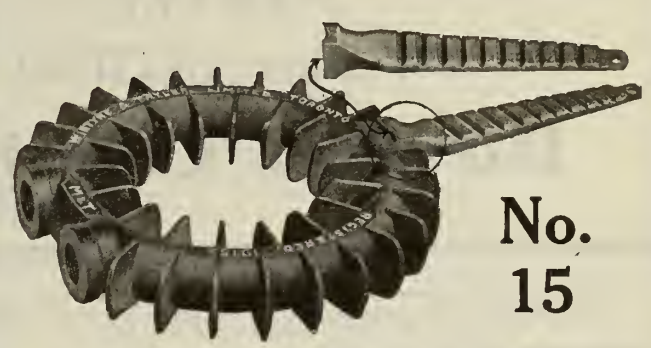
My Dad wears 'em

Known from Coast to Coast

R.G. LONG & CO. LIMITED

TORONTO CANADA

Boiler Coil



No. 15

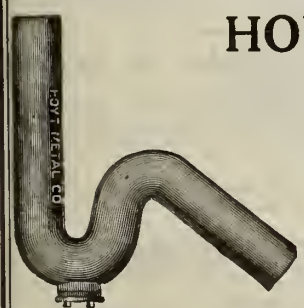
This efficient coil has an extreme diameter of 13". There is a very large heating surface, insuring maximum efficiency. Easily installed, durable in use, it has proved a highly satisfactory and lasting coil.

McIntyre & Taylor Limited

MONTREAL TORONTO WINNIPEG

HOYT METAL GOODS ARE KNOWN

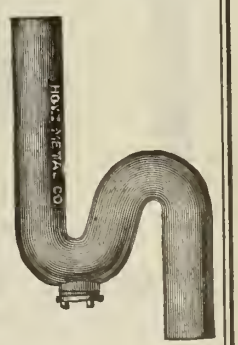
FROM COAST TO COAST



As time-savers there are none equal to our Wiping Solder, Bar or Wire Solder.

Hoyt Lead Traps, bends and waste pipe are in a class by themselves.

All our products are made to formula.

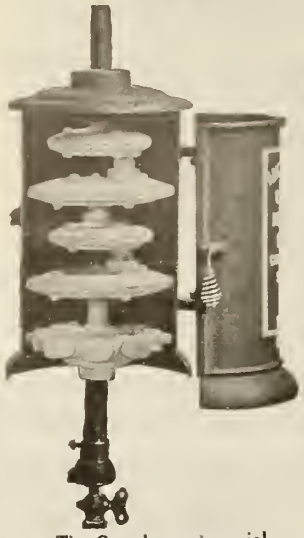


Our Mixed Metal Sales Amount To Over $5,000,000 Annually.

Write your Jobber

HOYT METAL COMPANY, TORONTO, ONTARIO

New York, N. Y., London, Eng., St. Louis, Mo.



The Complete Imperial Water Heater

BY installing "IMPERIAL" heaters, you serve your customers' interests, as well as your own.

"IMPERIAL" heaters, are made in three sizes, for the ordinary, heavier, or heaviest requirements.

PERFECT HEAT baffling. Absolute water CIRCULATION.

Sectional View Showing Water Flow

POWERFUL. ECONOMICAL.

For either ARTIFICIAL or NATURAL Gas.

IMPERIAL CITY HEATERS, LIMITED

SARNIA, CAN.

The Wrench of 25% Greater Efficiency

TRIMO PIPE WRENCH

Two new features have been recently added to the Trimo Pipe Wrench, namely Nut-Guards, in all sizes, and unbreakable steel frames, in leading sizes.

The Nut-Guards prevent the accidental rotation of the nut while in use.

These improvements add 25% to the usefulness of the tool.

The Trimo Pipe Wrench is made with wood handles in 4 sizes, 6-in., 8-in., 10-in., 14-in. and in steel handles in all sizes, 6-in. to 48-in. inclusive.

All Trimo Pipe Wrench parts are interchangeable.

The inserted jaw in the handle can be readily replaced when worn, thus adding to the life of the tool.

Nut with Nut-Guards

Inquiries from Importers and Dealers Solicited Send for Catalogue No. 55.

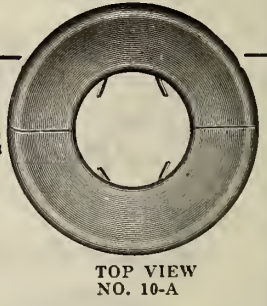
TRIMONT MANUFACTURING CO.

Cable Address: Triwrench Code: Western Union

Roxbury (Boston) Mass., U.S.A.

OPEN VIEW NO. 10-A

The CEILING PLATE that's better



TOP VIEW NO. 10-A

THE NO. 10—A NARROW FLANGE PLATE—IS A STEEL HINGED PLATE. FLANGES ¾" WIDE. HIGHLY FINISHED. ESPECIALLY DESIGNED FOR TWIN CONNECTION "NARROW."

The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

High quality at the right price.

Gem No. 4.

Gem No. 4 Automatic Air Valve

Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

Write for catalog showing our complete line of specialties.

The BEATON & CADWELL MANUFACTURING Co.

New Britain, Conn.

Eastern Agent: J. R. Devereux & Co., 358 Beaver Hall Square. Montreal. Western Agent: A. E. Hinds & Co., Chamber of Commerce, Winnipeg.

ADVERTISING INDEX

Allison, K. B. 42
Amherst Foundry Co. ....Inside Front Cover
Anthes Foundry Co. 46
Armstrong Mfg. Co. 48
Beaton & Cadwell 44
Beaton & Corbin 48
Borden Canadian Co. 48
Buffalo Specialty Co. 6-7
Canada Metal Co. 13
Canadian Brass Co. 1
Canadian Tube & Iron Co. 47
Canadian Wolverine Co. 9
Chamberlain Desolvo Co. 42
Commercial India Rubber Co. 48
Dunham, C. A., Co., Ltd. 3
Empire Manufacturing Co. .....
Outside Front Cover
Fittings Limited 11
Gummer, G. W. G., Ltd. 2
Galt Brass Co. ..... Back Cover
Gurney Foundry Co., Ltd. 38
Hall, J. H. 47
Hamilton Stove & Heater Co. 38
Hause Mfg. Co., Chas. F. 48
Hoyt Metal Co. 43
U. T. Hungerford 47
Imperial City Heaters, Ltd. 44
International Malleable Iron Co. .....
Inside Back Cover
Jardine, A. B., & Co. 4
Jenkins Bros., Ltd. 45
Katie Foundry, The 43
Kerr Eng. Co., Ltd. ..... Inside Back Cover
Long, R. G., & Co. 43
McDougall & Co., R. 47
McIntyre & Taylor, Ltd. 43
Modern Heating & Engineering 3
Moline Heat 9
Morrison Brass Mfg. Co., Ltd., Jas. 39
Mueller Mfg. Co. 37
Murphy Victory Furnace Co. 10
National Steel Tank & Mfg. Co. 4
Port Hope Sanitary Mfg. Co. 14
Scaife & Sons Co., Wm. B. 46
Standard Sanitary Mfg. Co. 5
Steel & Radiation, Limited 39
Taylor Forbes Co. 11
Trimont Manufacturing Co. 44
Toronto Hardware Mfg. Co. 46
United Brass Founders & Engineers, Ltd. 42
Wallaceburg Brass & Iron Co. 41
Warden-King, Limited 8
Williams, J. H., & Co. 9

Why Jenkins Bros'. Valves Are Superior

Fig. 106

They are the original renewable Disc Valves. They have more imitators than all other makes of valves combined. They have kept pace with increasing steam pressures and severe working conditions. They are of the simplest design, and can be easily repaired by any man of ordinary intelligence. They are made interchangeable in every part, and any part can be duplicated promptly and inexpensively by the dealer. In the majority of cases they can be repaired by merely changing the disc without the laborious task of regrinding.

Fig. 108

They are recognized as the Standard Steam Valves in all parts of the World, and wherever there are supply houses—Jenkins Bros'. Valves will be found. The Standard of quality never changes except to improve, and while to-day there are hundreds of imitators, the sales of genuine Jenkins Bros'. Valves are constantly increasing.

Fig. 114

Catalogue No. 8 sent free on request.

Fig. 124

HEAD OFFICE AND WORKS:
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Montreal, Canada

JENKINS BROS.
LIMITED

Agencies in all the Principal Countries of the World

EUROPEAN BRANCH:
6 Great Queen Street
Kingsway, London, W.C. 2
England

Steel Tanks for Every Purpose

A FEW "SCAIFE" SPECIALTIES:

Air Receivers
Boilers—Hot Water
Expansion Tanks
Filters (water)
Hot Water Tanks
Hydro-Pneumatic Tanks
Range Boilers
Tanks (steel)
Water Supply Tanks

117 years old Founded 1802

WM. B. SCAIFE & SONS CO.

New York, N.Y. Office: 26 Cortlandt St.
Home Office: Pittsburgh, P
Chicago: 38 South Dearborn St.

Win Your Customers' Confidence by Installing

ANTHES SYPHONS

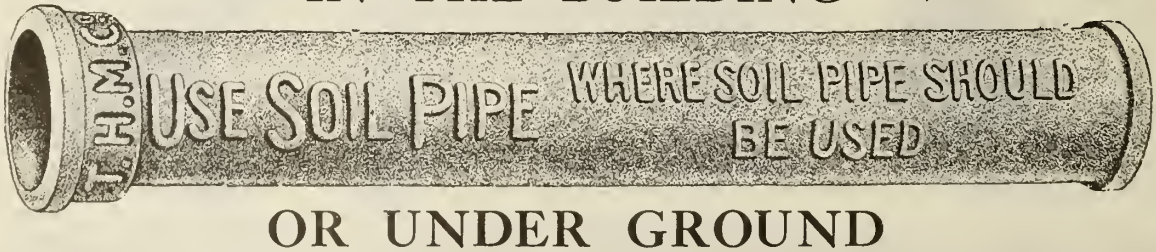
Consider yourself and future business in what you handle. Anthes Syphons will take care of your business, build it up and assure future orders. Every time you install Anthes Syphons you add an asset to your business, because your clients will have an increased respect for your judgment and will "boost" your business.

We will furnish you with Sewage Disposal Blueprints on request

Anthes Foundry Co., Limited

TORONTO and WINNIPEG

IN THE BUILDING



OR UNDER GROUND

ASK YOUR JOBBER FOR T.H.M. CO. BRAND OF SOIL PIPE AND FITTINGS.

TORONTO HARDWARE MFG. COMPANY, - Toronto, Canada

WE MANUFACTURE A FULL LINE OF HIGH-GRADE RANGE BOILERS

WROUGHT PIPE

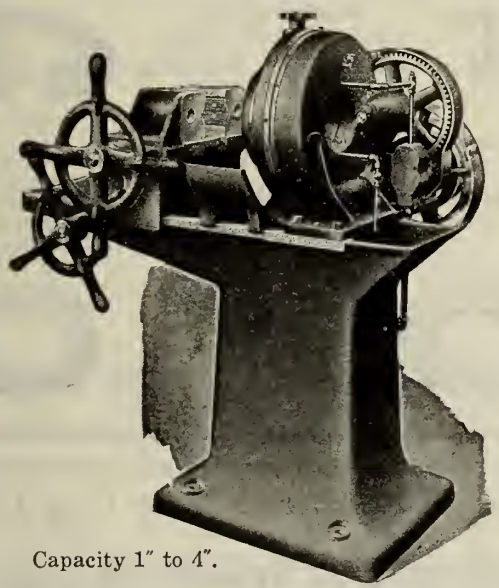
BLACK and GALVANIZED
SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

All Sizes of NIPPLES (Black and Galvanized)

Ask your jobber for CT *Brand of Wrought Pipe*

CANADIAN TUBE & IRON CO., LIMITED, MONTREAL
Works: Lachine, Can.



Capacity 1" to 4".

The Hall Simplex Improved No. 4 Pipe Machine

Easily operated by unskilled help. An ideal machine for the plumber, the steamfitter or the jobber. Will thread pipe as short as 4½ inches. Let us mail you full information regarding this money saver together with catalog covering our complete line including:

Pipe threading machines ... ⅛ to 18"
Nipple machines ..... ⅛ to 4"
Roller pipe cutters ..... ⅛ to 4"

Delivery from stock.

JOHN H. HALL & SONS, LIMITED
BRANTFORD, CANADA

This is a "Q" Foot Valve

And it Just *CAN'T* Leak

There are more pump troubles caused by "leaky" valves than from all the wear and tear which occurs in the average life of a pump.

The "Q" valve will overcome all priming troubles, and water once raised above it; through the suction line, will not leak out.

If you want the pumps you instal to give maximum, you will require to use the only valve on the market that JUST CAN'T LEAK.

Made in sizes from 1 to 8-inch.

R. MACDOUGALL CO., LTD.
GALT., CANADA

WORTH WHILE PUBLICITY

The general tendency in Canada is towards selling high-grade goods. There never was a time, in the history of the country, when all branches of the Canadian trade were more interested in securing all possible information regarding products they can recommend and guarantee to their customers. Advertisers in SANITARY ENGINEER reach the cream of the trade in all parts of the Dominion.

"Star Brand" Seamless Brass and Copper Tubes

including

Iron Pipe Sizes

also

Seamless Brass Condenser Tubes

READY FOR IMMEDIATE SHIPMENT

from our New York Warehouses

Also a complete line of Mechanical Cold Drawn Seamless Steel Tubing

U. T. Hungerford Brass & Copper Co., Lafayette, White and Franklin Sts., New York, U.S.A.

They Are Wanted "Beaver"

Square End Pipe Cutters

They meet the exact requirements for a pipe cutter.
Don't be bothered with the expense and trouble of hack saw blades—$20 to $30 a year, and the burrs and reduced pipe area resulting from their use. Beaver Square End Pipe Cutters leave a clean-cut square end—no reaming or filing required. The knives feed automatically—set ready to cut when placed on the pipe.
They work easily and give satisfaction. In use on conduits by electrical contractors everywhere.

The Borden Canadian Company
110 Church St. - - Toronto, Canada

GENUINE
ARMSTRONG STOCKS and DIES

Hinged Pipe Vises *Pipe Cutters*
Pipe Threading Machines
—MANUFACTURED BY—
THE ARMSTRONG MFG. Company
317 Knowlton Street, BRIDGEPORT, CONN
248 Canal Street, NEW YORK

"BC" COMBINATION COLD ROLLED STEEL Floor and Ceiling PLATES

Carried by the leading supply houses

No. 15

Puts just the right finish on that heating job

Send for catalog of complete line of "B. & C." goods.

No. 1 Valve

Stock carried by our Canadian Representative
W. H. CUNNINGHAM & CO.
183 Church Street
Toronto, Ont.

No. 16

The Beaton & Corbin Mfg., Co.
Southington, Conn., U.S.A.
The Old Original Company

No. 17

BRASS ROD *For Sale*

at a very attractive price.

Free Turning ROUND BRASS ROD

Mill lengths of the following sizes:—

30,000	lbs.	¼" diameter
62,500	"	⅝" "
73,250	"	¾" "
27,500	"	15/16" "
46,750	"	1" "

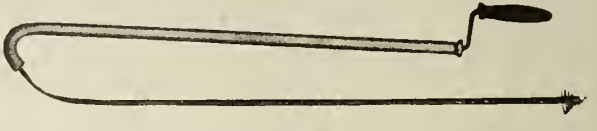
Above is all new material and is now stored at the manufacturers' plant in Connecticut, ready for prompt shipment and has passed Government inspection.
Address Box 325, Sanitary Engineer.

Chas. F. Hause Mfg. Co., Ltd.

Manufacturers of the

Hause Closet Auger

Seamless brass tube—high-grade 7-16 steel spring. Made with 3-foot and 6-foot springs.



Ask your jobber or write us direct. Made in Omaha, Nebraska, U.S.A.

Canadian Distributors
Empire Mfg. Co., Ltd., London and Toronto

"VALVENE" Discs (REGISTERED)

Specially prepared for Hot and Cold Water Taps. All sizes from ½ inch to 1½ inches. Soft, Pliable, and "Joint-Perfect."
Price List and Samples on Application.
THE COMMERCIAL INDIA RUBBER MANUFACTURING & SUPPLY CO., LIMITED
SOLE MANUEACTURERS
586 Commer ad London, E.1.

FOR SALE

FOR SALE—PLUMBERS' SUPPLIES OF ALL makes, at prices that protect the plumber. American Plumbers' Supplies, 14 Craig St. West, Montreal.

The Advertisers would like to know where you saw their advertisements—tell them.

Pipe Fittings

Made in Canada

M Brand Pipe Fittings, etc., give a service and satisfaction that will invariably get you re-orders and much new business as well.

A trial of the goods will prove this claim.

CAST IRON FITTINGS
With this brand mean fittings made with iron of high tensile strength—proper proportions and correct tappings.

RECESSED DRAINAGE FITTINGS

MALLEABLE FITTINGS
With this brand mean fittings made of Air Furnace Refined Iron, reamed and tapped to gauge with perfect threads

Standard and Extra Heavy Flanged Fittings and Flanges. Galvanizing Malleable and Gray Iron Castings of all Kinds.

International Malleable Iron Co., Limited, Guelph, Ontario, Canada

There Are Lots of Gate Valves

Advertised and Sold

but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES

Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.
Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.
Approved by the Fire Underwriters' Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

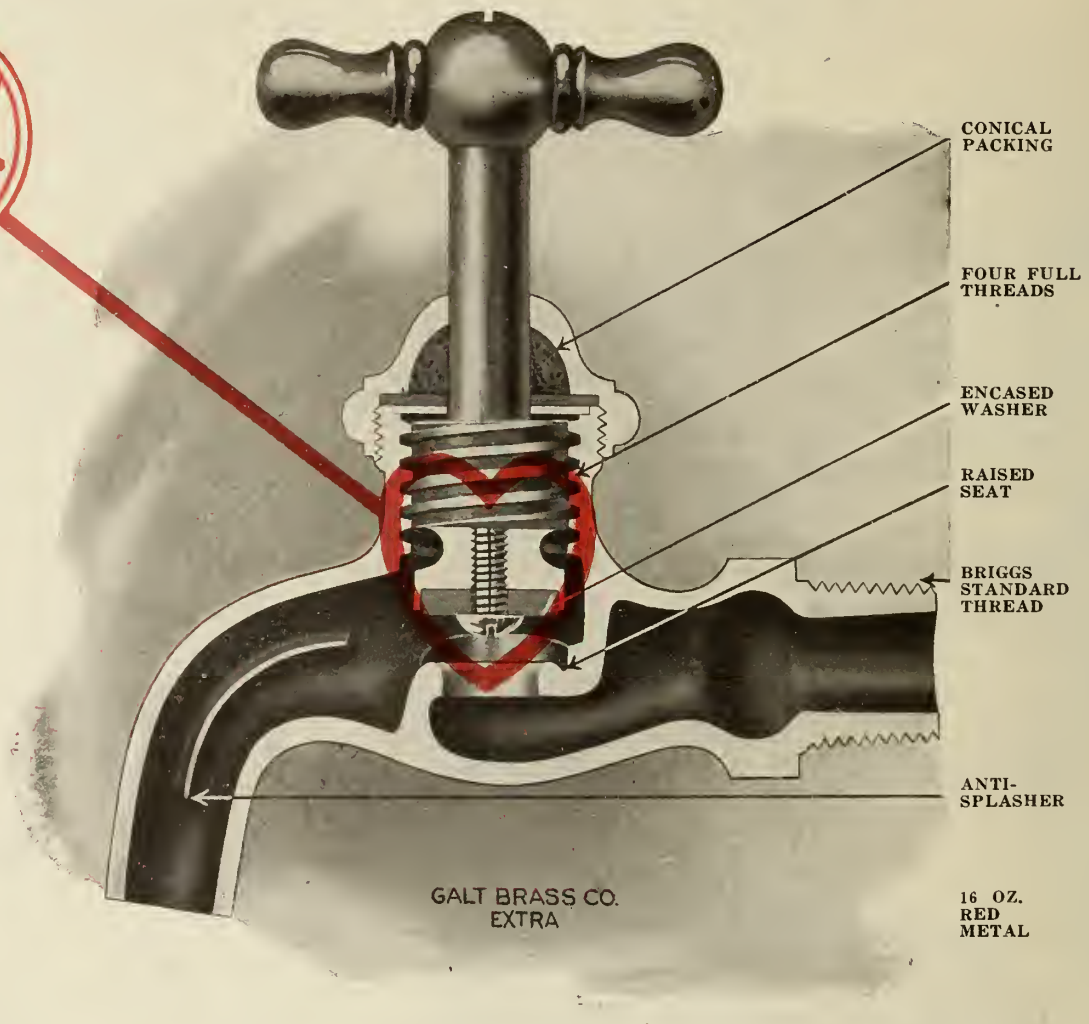
TRADE PERFECTO MARK

"GOOD" Washer

WARRANTY

Any article of our Manufacture proving defective will be replaced with TWO of its kind gratis.

Conical Packing, Four Full Threads, Encased Washer, Raised Seat, Briggs Standard Thread, Anti-Splasher, 16-ounce Red Metal



The Good Manufacturing Company's Graphite Composition Seat Washer is a distinctive feature of all **Perfecto** compression work.

No other compression work is furnished with "Good" seat washers.

Only the high reputation and dependability of **Perfecto** products would induce the Good Manufacturing Company to endorse **Perfecto** goods in this way.

Galt Brass Company, Ltd.

Galt, Canada

Toronto Office: 67 Adelaide St. E.

Sanitary Engineer
Plumber and Steamfitter of Canada
VOL XIII. PUBLICATION OFFICE, TORONTO, SEPTEMBER 15, 1919 No. 17.

PLAY SAFE!

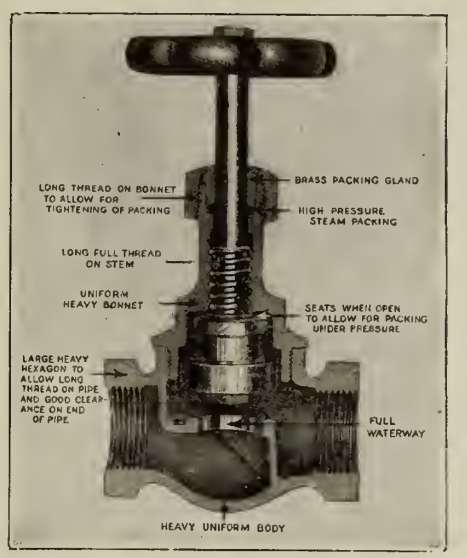

LONG THREAD ON BONNET TO ALLOW FOR TIGHTENING OF PACKING
BRASS PACKING GLAND
HIGH PRESSURE STEAM PACKING
LONG FULL THREAD ON STEM
UNIFORM HEAVY BONNET
SEATS WHEN OPEN TO ALLOW FOR PACKING UNDER PRESSURE
LARGE HEAVY HEXAGON TO ALLOW LONG THREAD ON PIPE AND GOOD CLEARANCE ON END OF PIPE
FULL WATERWAY
HEAVY UNIFORM BODY

PLATE A840
JENKINS DISC GLOBE VALVE

THE whole steam system will be dubbed wrong if a faulty valve is installed, no matter how good the other fittings are.

The sanitary engineer cannot afford to have his good work reflected upon by so small, yet so important, a factor of the work.

Make sure that the valve is right above everything else.

"Emco" valves are fitted with special high heat-resisting "Radium" discs which last a lifetime.

They are registered in all provinces of the Dominion, our ordinary line being approved for 175 lbs. working pressure.

All goods are thoroughly inspected and tested before they leave our factory.

Send for our catalogue. Specify "Emco" valves from your jobber or order direct from us.

Empire Manufacturing Co., Limited

London and Toronto
Canada

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While

A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for **BEAVER BRAND CAST IRON ENAMEL WARE**

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

ONTARIO:
Monarch Brass Mfg. Co., 71 Brown St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes, 120 Lombard St., Winnipeg

"Standard"
"Perfection" Built-in Baths

Made in One Piece Enamelled All Over

These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in-Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners meaning bathroom sanitation.

Made in 5 and 5½ foot sizes.

Illustrations on request.

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Limited

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Toronto Store:
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Winnipeg Showrooms:
76 Lombard Street

Hamilton Store:
20-28 Jackson Street West

Montreal:
358 Beaver Hall Square

Calgary:
325 Eighth Avenue West

Vancouver:
847 Beatty Street

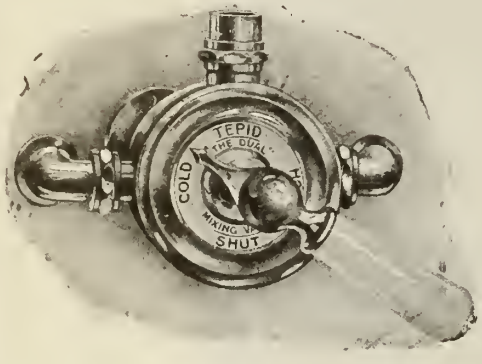
"MADE IN CANADA"

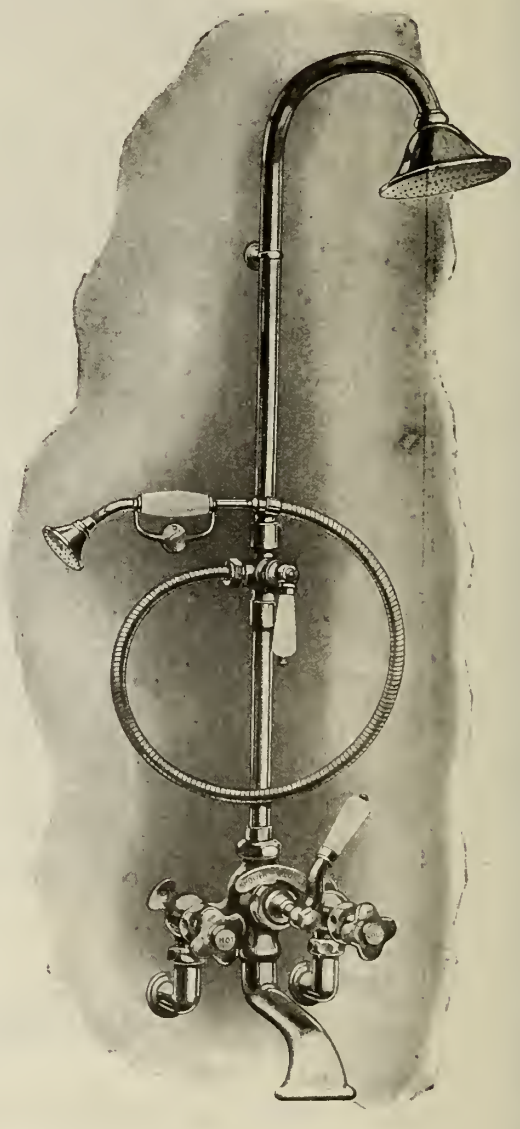
SANITARY ENGINEER, September 15, 1919. Vol. XIII., No. 18. Published 1stand 15th of every month at 143-153 University Ave., Toronto, by The MacLean Publishing Co., Ltd. Yearly subscription price, Canada, $1.00; United States, $1.50; Great Britain and the Colonies, 4s. 6d.; elsewhere, $2.00. Entered as second-class matter at the Post Office Department, Ottawa. Entered as second-class matter July 1st, 1912, at the Post Office at Buffalo under the Act of March 3rd, 1879.

G. & W. G. GUMMER, LIMITED

EFFINGHAM BRASS WORKS, ROTHERHAM, ENGLAND

And at
9 Fenchurch St.,
London





"Dual" Mixer

A valve that really mixes Hot and Cold Water, and maintains a uniform mixture.

For ease of operation, simple construction and easy installation, it has set a new standard of efficiency.

Cold Water must be turned on first, no possibility of scalding.

Made in several forms for Showers, Sprays, Operating Rooms, etc.

At the well-known works of Messrs. Brunner, Mond & Co. these valves provide baths for 2,500 employees.

G. & W. G. GUMMER, LIMITED

Manufacturers of every description of

Engineers,' Plumbers' and Sanitary Quality Brassware

An Extra Strong Drop-Forged Pipe Wrench

by the manufacturers of the famous "Little Giant" Die

A Quality Pipe Wrench—a pipe wrench you can depend on. One that grips tighter as the strain increases and positively will not slip.

"Wells" Pipe Wrench is

"Forged for Service" **-- it will last a lifetime, yet it costs no more than the ordinary kind.**

Ask your dealer for it or order direct from Galt.

Little Giant

WELLS BROS.

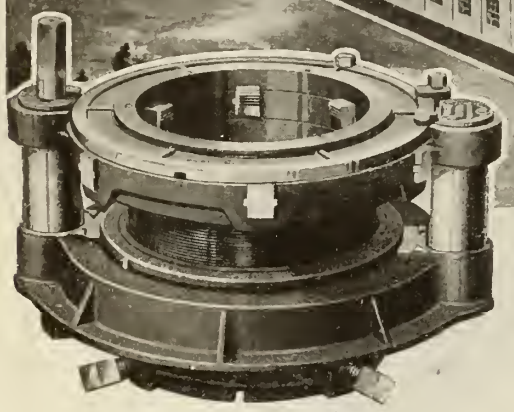
Company of Ltd. Galt, Ontario

Canadian Plant of the Greenfield Tap & Die Corp.

CANADA

World's Largest Manufacturers of Screw Cutting Tools.

BEAVER



No. 80 Geared—4½ to 8 inch.
No. 90 Geared—9 to 12 inch.

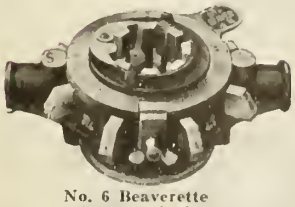
THE HOME OF "BEAVER" TOOLS

The largest and best-equipped factory in the world devoted exclusively to the manufacture of high-grade, easy-working tools for cutting and threading pipe.

Many Popular Selling Features

No. 26 Ratchet
1 to 2 inch.

No. 41 Geared
2½ to 4 inch.



No. 6 Beaverette
¼ to ¾ inch.

Beaver Easy-Working Die Stocks are quick working; the dies are narrow and receding, moving outward as the thread advances. 2-inch pipe is easily threaded with one hand; 4, 6, 8, 10 or 12-inch pipe is threaded by one man. Beaver Dies will thread several sizes of pipe without changes.

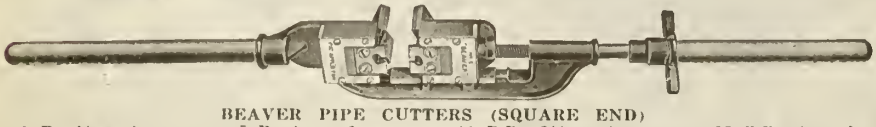
A self-centering Chuck eliminates troublesome bushings. Beaver Dies are adjustable—move the handle, that's all! Beaver Tools are fully guaranteed. The user and the dealer are both protected. Write for circular and prices. "The user must be pleased."

Showing burred edge of pipe cut with ordinary wheel cutter.

Showing the clean cut edge of pipe when Beaver cutter is used. Note rings cut from pipe. No burred edge to reduce the opening.

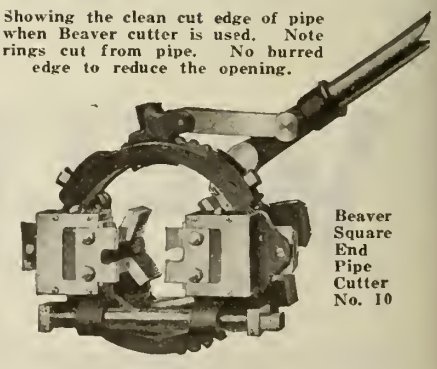
The Borden - Canadian Co.

110 Church Street, Toronto

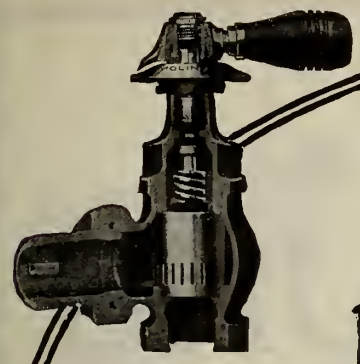


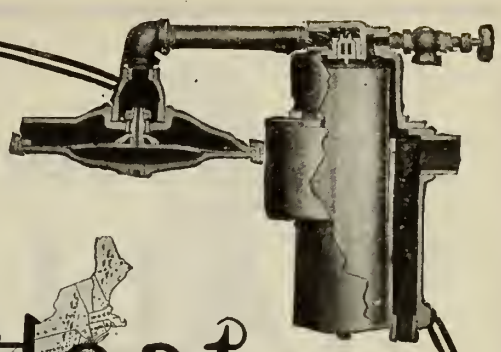
BEAVER PIPE CUTTERS (SQUARE END)

1 B., ⅛ to 1. 5 B., ½ to 2. 10 B.R., 2½ to 4. 15 B.R., 2 to 6



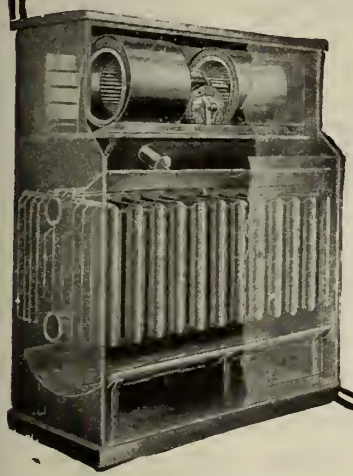
Beaver Square End Pipe Cutter No. 10





A GOOD LINE
of Equipment for
YOU to sell—

Moline Heat
EVERYWHERE



Moline Heat — System of Steam Circulation and Control

UNIVENT — Last Word in Combined Heating and Ventilating

"LIVE OUTDOORS-INDOORS"

Liberty Draft Controller — and other products

Write for Complete Line of Catalogs TODAY

Address Dept. G

MOLINE HEAT
Moline, Ill.

A Business Getter for

The Plumber

The Anthes Syphon is a powerful business producer. Cast in one piece with no moving parts to get out of order, and working on natural laws it gives perfect satisfaction to your clients. If they need an additional Syphon, or their friends need one, you are assured of the order.

Anthes Syphons add to your business all the time.

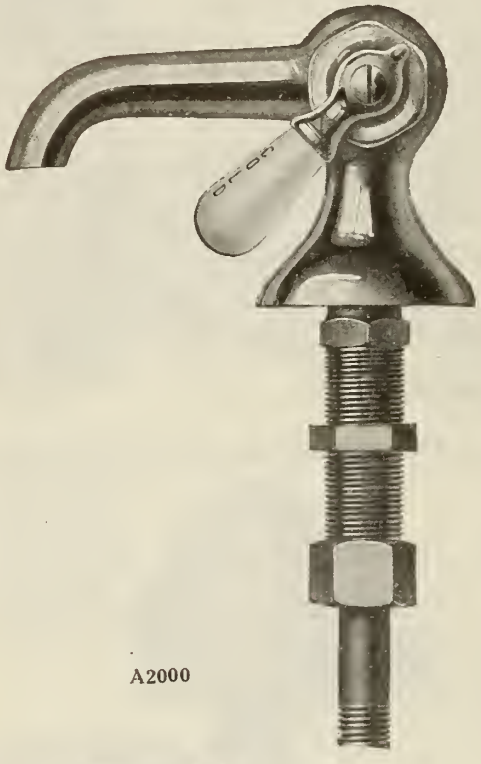
Sewage Disposal Blueprints on request.
Prompt Shipments.

Anthes Foundry Co., Limited
TORONTO and WINNIPEG

See a few of the

WALLACEBURG

QUATURN GOODS



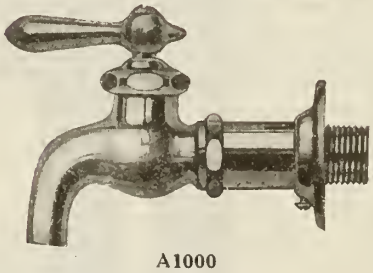
A2000

And What They Will do for You

Quaturn Cocks are designed with a sensible interior construction; they close **with** the pressure; all the unavoidable wear is made to come on renewable parts. They are heavily finished in nickel and of graceful design.

You can pronounce them "leak-proof" with confidence.

You will find them a promoter of business.



A1000

A3500

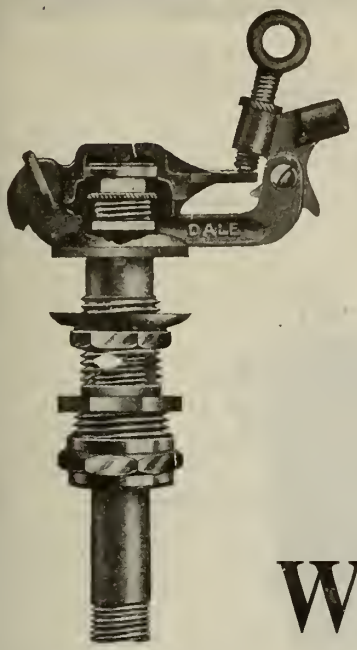
THE WALLACEBURG BRASS & IRON MANUFACTURING COMPANY, Limited

Wallaceburg Ontario

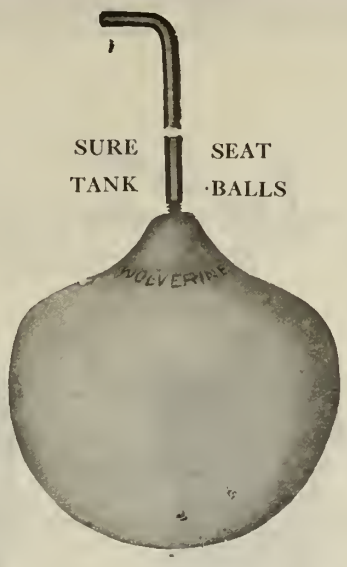
Toronto
10 Wellington St. E. Phone: Main 2355
Mr. L. N. Vanstone

Winnipeg
Galt Building Phone: Garry 3389
Moncrieff & Endress, Ltd.

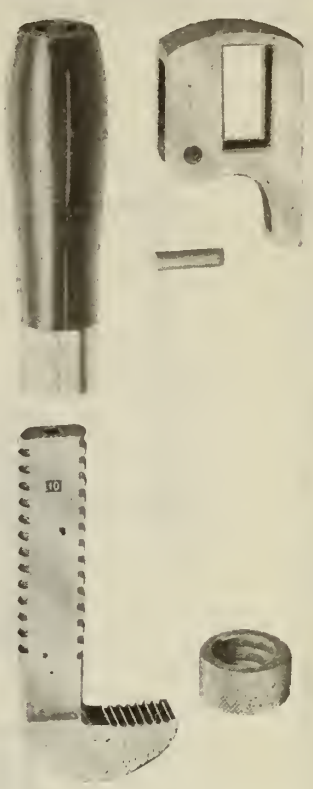
Montreal
358 Beaver Hall Sq. Phone: Main 7531
J. R. Devereux & Co.



DALE BALL COCKS
with
Removable Porcelain
Seat



WOLVERINE PRODUCTS



STILLSON REPAIRS

SAW AND FINE EDGE CUTTERS

You should investigate these lines. Besides those shown here there is a host of others. For instance, see our Washers and Pipe Cutter assortments, and the way they are packed in convenient, partitioned, strong, dovetailed shelf boxes with sliding lids.

The merchant should figure on the direct money value of the reduced selling cost, due to better display and ease of handling.

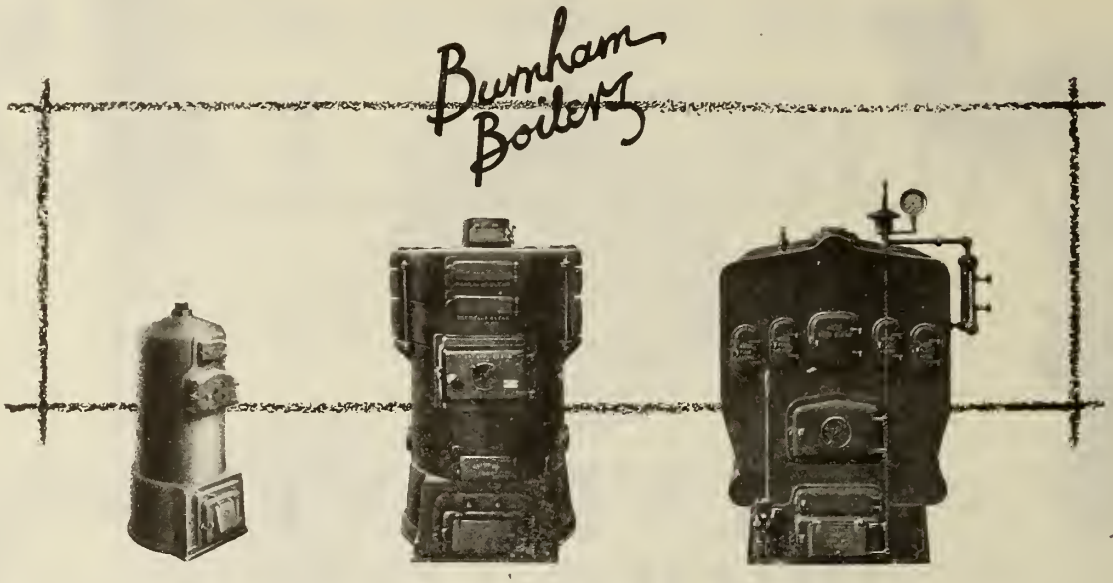
Have you seen Wolverine Kantleak Floats? They are made absolutely without solder, of heavy copper. Spuds of red brass are swedged on the inside to withstand acid or alkaline water. Wolverine Coil Furnaces are fitted with safety valve and bulb, and with air pump. Wolverine Waste Tank and Spud Washers are made of the finest quality of rubber obtainable.

These are but a few of the many lines that are omitted here. We cannot, for obvious reasons, make a catalog of an advertising page.

Write for Catalogs and Discounts

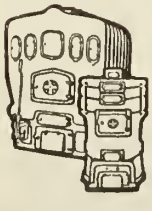
WOLVERINE
LIMITED

12 MERCER STREET, TORONTO



There is a Burnham Boiler for every need from a water heater to the big tubulars

For Dealers, we have a special proposition in which we are sure you will find particular interest right now.



Lord & Burnham Co. Limited of Canada
Boiler Department
ROYAL BANK BUILDING, TORONTO
Factory: St. Catharines, Ontario

William and James

A Little "Straight Talk" to the Canadian Plumbing Trade

WILLIAM began business five years ago in a small shop on Front Street. He cleaned the windows; a bright sign appeared announcing William Smith, Plumber. There was a modest but attractive display of shining fixtures. The floor was swept, the store was clean and neat. In the workshop the absolute rule was neatness and order, no waste. When an assistant was brought in this rule was insisted upon. Now each one of the ten assistants agrees when engaged to maintain this rule.

JAMES started up some five years back in a place on Main Street. He told some of his friends about it and with a marking brush wrote a cardboard sign which told that JAMES JONES, PLUMBER, had located here. On arrival of supplies he gave orders to "stick 'em in there any place." In the workshop there is a splendid example of what is meant by "CHAOS." The two assistants now engaged help to make matters worse.

WILLIAM bought a small and simple set of books and a card index for prospects. This has grown into a modern up-to-the-minute system and the office boasts a typewriter and an adding machine. A bookkeeper and a stenographer look after the details and are able to courteously receive customers when William is absent, take notes as to requirements and lay foundations for future business.

JAMES never could be bothered with that bookkeeping stuff. He kept his records in a scribbling book, on bits of paper and backs of envelopes, He has now added a daybook and ledger but "never has time" to get them up to date and a young shop helper has to lend a hand occasionally.

WILLIAM has a reputation for "QUALITY" goods, for sharp attention to business, for courtesy to his clients, for consideration of their needs. He has a good rating at the bank. An automobile and a motor truck add greatly to the service and efficiency of his business.

JAMES is known as "the cheap man." He puts in a job which will "do well enough." That's the way he gets the business he has procured. He neglects to pay his bills, drafts on him are continually returned unaccepted because he "has no time to attend to them." A horse and wagon still do duty for deliveries and trucking.

These two men began with equal opportunities. The examples are multiplied in almost every town and city.
Why not cultivate the lines of William's progress?
QUALITY, EFFICIENCY and SERVICE.

TRADE B.O.T. MARK

THE CANADIAN BRASS CO.
LIMITED

GALT, ONTARIO

CANADIAN BRASS GALT ONT

PNEUMATIC WATER SUPPLY SYSTEM FEATURE OF STANDARD SANITARY DISPLAY

AN exhibit of more than passing interest at the Canadian National Exhibition this year was that of the Standard Sanitary Mfg. Co., Toronto. This included a display of pneumatic water supply systems, sanitary bathroom and kitchen equipment which should bring splendid results to those sanitary engineers who follow closely on the trail of those of their customers who witnessed same.

Each and every day and all of each day a big crowd was gathered about the exhibit asking questions and securing information from the courteous salesmen of the company. The favorable impression left in the minds of the visitors is one which can be capitalized by the sanitary engineer in his own town.

One feature of particular interest in the exhibit was that which showed equipment for the farm home, including pneumatic water systems. The value of this display was quite evident, demonstrating as it did, that the farmer though one hundred miles from the city, can equip his home with the same conveniences in every respect as those citizens served by a city or town water supply.

There is no time better then the present for the sanitary engineer to advertise himself as able to instal the class of Standard Sanitary equipment seen at the Exhibition. Now is the opportune moment to secure contracts for installation of pneumatic water systems, bathrooms and kitchen equipment which will keep your men busy. Lay out your plans and book up your customers now while they are in the mood to be approached on the subject of using this class of material.

The display which is reproduced above speaks for itself. There is no more attractive line of merchandise than Standard Sanitary enamelware. This class of goods lends itself particularly well to display and at all times the sanitary engineer should keep his wares out where they will be seen.

The advertising done by this progressive firm to bring their goods to the attention of your customers should not be lost on you. Follow it up and cash in on greater sales of Standard Sanitary equipment. Your opportunity is here—take advantage of it.

Williams' Improved "Vulcan" Drop-Forged Chain Pipe Wrench

FEW tools are called upon to stand greater strain and harder wear than the pipe wrench. Because Williams' "Vulcan" Chain Pipe Wrenches have withstood every test during years of hard, continuous service under all conditions, they have earned a well-deserved reputation for dependability, and are favorably known the world over. They embody every good feature for which Williams' *Superior* quality stands.

Made in 8 sizes for ⅛ to 18 inch pipe. All Flat Link Chains are "proof-tested" on a standard tension machine and "certified." Every wrench is unconditionally guaranteed.

Ask for our descriptive Booklet of Pipe Tools

J. H. WILLIAMS & CO.
"The Wrench People"
77 Richards Street, Brooklyn, New York

The A. G. Low Co., Ltd., 77 Pacific Ave., Saskatoon, Sask.
Agts. for Manitoba, Saskatchewan, Alberta and British Columbia.

Extended Surface Special Tapping

M. & T. COILS

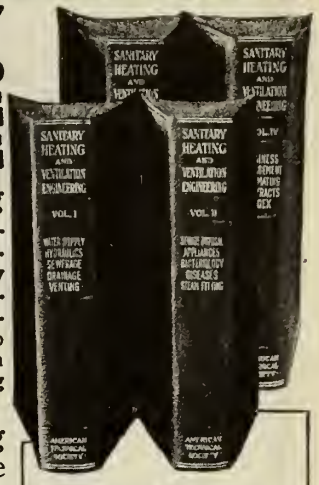
are specially designed to heat water with less fuel. They are not merely cored castings; note the extended heating surface and its capacity for heat absorption; examine the special tappings. M. & T. are the most efficient coils obtainable—the kind you want.

McIntyre & Taylor
LIMITED

MONTREAL 55 St. Francis-Xavier St.
TORONTO 501-3 Queen St. W.
WINNIPEG 322 McIntyre Block

GET IN THE BIG MONEY CLASS NOW

SANITARY HEATING AND VENTILATING ENGINEERING



SANITARY Heating and Ventilating Engineering offers wonderful opportunities for advancement and money making right now. Modern methods and appliances are fast replacing the old ones, and the men who are up-to-date — the trained men — the men who know — are going to reap the benefit.

Get your share of the big money now. Here is the first thing for you to do — tear the coupon off this page and mail it to us today. It won't obligate you in any way and you don't have to send a penny, but it will bring you these four big volumes — just off the press — packed full of the very things you need to train yourself — all worked out for you in clear, understandable English by eighteen of the most successful men in these professions today.

No matter what your job is or how much you earn, you need these books — and you need them now. If you are in business for yourself, they will make your business bigger and better — the volume on business management, estimating and contracts and specifications alone will do it.

4 big volumes, size 5½ x 8¼ ins., bound in flexible American Morocco and trimmed in gold: 1454 pages: over 1100 pictures, diagrams and plates.

Here's what the Books Contain Thousands of problems under the following headlines are all worked out and made as simple as A-B-C.

Sanitary Science and Materials.
Water Supply. Hydraulics.
Sewers and Drains.
Drainage and Venting.
Sanitary Appliances.
Sewage Disposal.
Bacteriology and Sanitation.
Infectious Diseases.
Steam and Hot Water Fitting.
Domestic Hot Water Supply.
Heating and Ventilating Engineering.
Sheet Metal Work.
Business Management.
Estimating.
Contracts. Specifications.
Mechanical Drawing.
General Index and Review Questions and Index to Each Volume.

Free Consulting Service With these books goes free a year's consulting service in the American Technical Society, worth $12.00. This enables you to consult our engineers and experts for one year without charge. Ask as many questions within the scope of the book as you want for one year.

SHIPPED FREE

Examine the books and see for yourself just how valuable they are, but don't send us any money. The little coupon is all you need. Fill out all three lines and mail it NOW. It will bring you the whole set of books by express collect, and you can keep them seven days to use as you please—study them at home—take them to your shop—try to find some problem they won't answer, and ship them back at our expense if you think you can get along without them. If you want to keep the books after seven days' use, send us only $2.00. The balance can be sent in monthly payments of $2.00 each until the special introductory price of $13.80 is paid.

It will take years of hit-or-miss experience to gain what these books will give you in a short time; so don't pass up this opportunity—ACT NOW. We may never be able to offer this low price and these special terms again—only 7c a day. Tear off coupon before you lay this down and mail *today*.

AMERICAN TECHNICAL SOCIETY
Dept. H 1812 **CHICAGO, U. S. A.**

AMERICAN TECHNICAL SOCIETY, Dept. H 83 Chicago, U. S. A.

Please send me the 4-volume Library of Sanitary Heating and Ventilating Engineering for 7 days' Free Examination, shipping charges collect. I will send you $2.00 in 7 days and $2.00 each month until the special price of $13.80 is paid, and you will send me a receipt showing the books are mine. If I decide not to buy I will return the books in 7 days.

Name.....

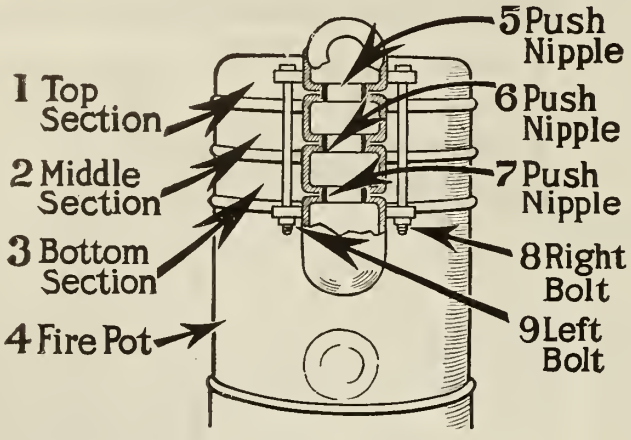
Address.....

Reference.....

SEND THE COUPON NOW

THE MOGUL BOILER

Has Only Nine Main Parts Above the Base



DON'T buy a boiler with a lot of parts. The more parts, the more chances of it getting out of order; the more repairs to pay for.

The MOGUL boiler has NINE (count them in the sketch) main parts above the base. Ordinary boilers have nineteen main parts. Thus other boilers have 111% more parts, and are that much more likely to get out of order. On the MOGUL there is not even a rubber gasket to wear out. If it had rubber gaskets, they would have to be replaced every year or two. And if the rubber gaskets were not replaced accurately (and this is most difficult to do) the circulation of the water would be impeded, and more coal consumed to propel the same amount of heat to the rooms. But the absence of rubber gaskets and the few parts in the MOGUL boiler ensure a wonderfully rapid circulation of water through it. And this rapid circulation of water is one of the causes of the MOGUL'S economy of fuel, fully one-third less coal being required.

The Mogul Boiler and Safford Radiator Systems

are in every way superior to ordinary heating systems. The Safford, you see, is a *specialized* hot water system—the product of an organization with 30 years' experience.

Branches: Ottawa, Winnipeg, Calgary

The Dominion Radiator Company, Ltd.

TORONTO

Branches: Montreal, St. John, Hamilton

PIPE AND THE PUBLIC WELFARE

By R. C. McWANE

A Book Just Off the Press

Every sanitary engineer should be the possessor of this book. It deals with pipe-making of all kinds, cast iron, wrought iron, steel, wood and tile pipe. It is valuable because it gives the users of pipe a true idea of how pipe lasts under various conditions when in service.

Price $1.00 Postpaid

MACLEAN PUBLISHING CO., LIMITED, Book Dept., University Ave., TORONTO

When Writing Advertisers Mention this Paper

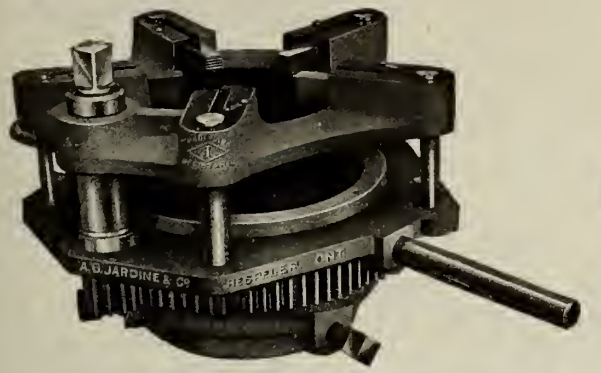
GURNEY-OXFORD BOILERS RADIATORS

FOR HEATING ANY DESCRIPTION OF BUILDING BY STEAM OR HOT WATER

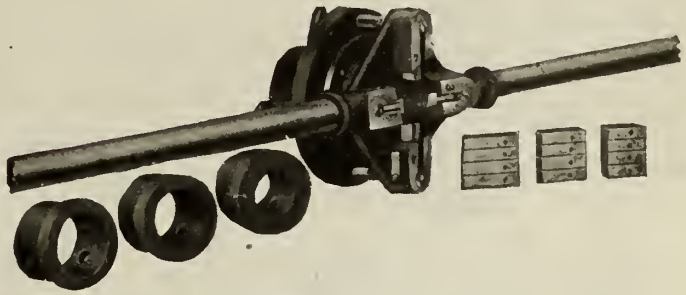
THE GURNEY FOUNDRY CO. LIMITED

TORONTO MONTREAL CALGARY WINNIPEG VANCOUVER

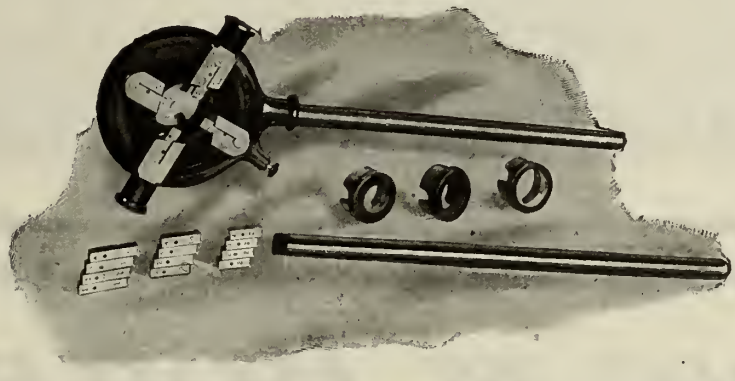
Perfect Threads



"Toledo" Geared Adjustable Threading Tool No. 2½. Capacity, 2½ to 6 in. inclusive. Weight, 120 lbs.



"Toledo" Adjustable Threading Tool No. 1. Capacity, 1 to 2 in., inclusive.



"Toledo" Adjustable Ratchet Threading Tool No. 1A. Capacity, 1 to 2 in., inclusive.

"Toledo" and "Jardine" Pipe-Threading Tools Cut Labor Cost in Half

With these efficient tools one man can do the work of two.

All the power applied to the dies is used to cut the perfect thread; no waste in friction on the pipe. As the tool advances on the pipe the cutters open out, putting the proper taper on the thread. The back of the cutters merely follow in the thread, serving to steady the whole.

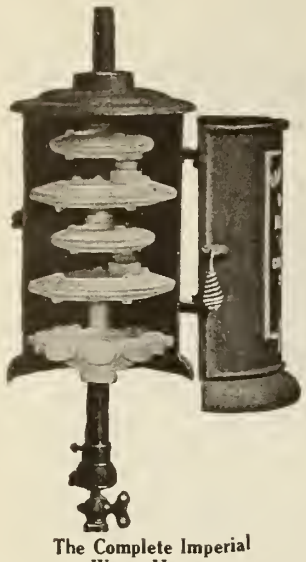
Jardine and Toledo Tools are of simple design for strength and service—no "gadgets" and "jimcracks" to get out of order, wrongly assembled or lost.

A ratchet fits these tools for use in any odd corner. The pipe may be threaded in place at an obvious saving—in many cases equal to the cost of the tool.

A. B. Jardine & Co., Limited, Hespeler, Ont.

Sole makers of "Jardine" Pipe-Threading Tools. Sole licensees to manufacture and sell Toledo Pipe-Threading Tools of Canada.

Agents, Winnipeg and West: Stanley Brock, Ltd., Winnipeg, Man. Brockville and East: J. R. Devereau, 358 Beaver Hall Square, Montreal. Belleville and West: W. H. Cunningham & Co., 183 Church St., Toronto, Ont.



The Complete Imperial Water Heater

BY installing "IMPERIAL" heaters, you serve your customers' interests, as well as your own.

"IMPERIAL" heaters, are made in three sizes, for the ordinary, heavier, or heaviest requirements.

PERFECT HEAT baffling. Absolute water CIRCULATION.

Sectional View Showing Water Flow

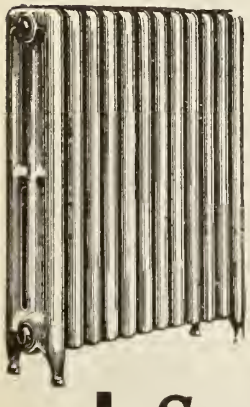
POWERFUL. ECONOMICAL.

For either ARTIFICIAL or NATURAL Gas.

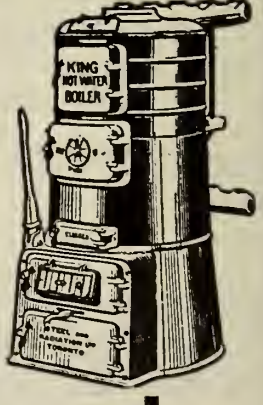
IMPERIAL CITY HEATERS, LIMITED

SARNIA, CAN.

KING HOT WATER BOILERS AND IMPERIAL RADIATORS



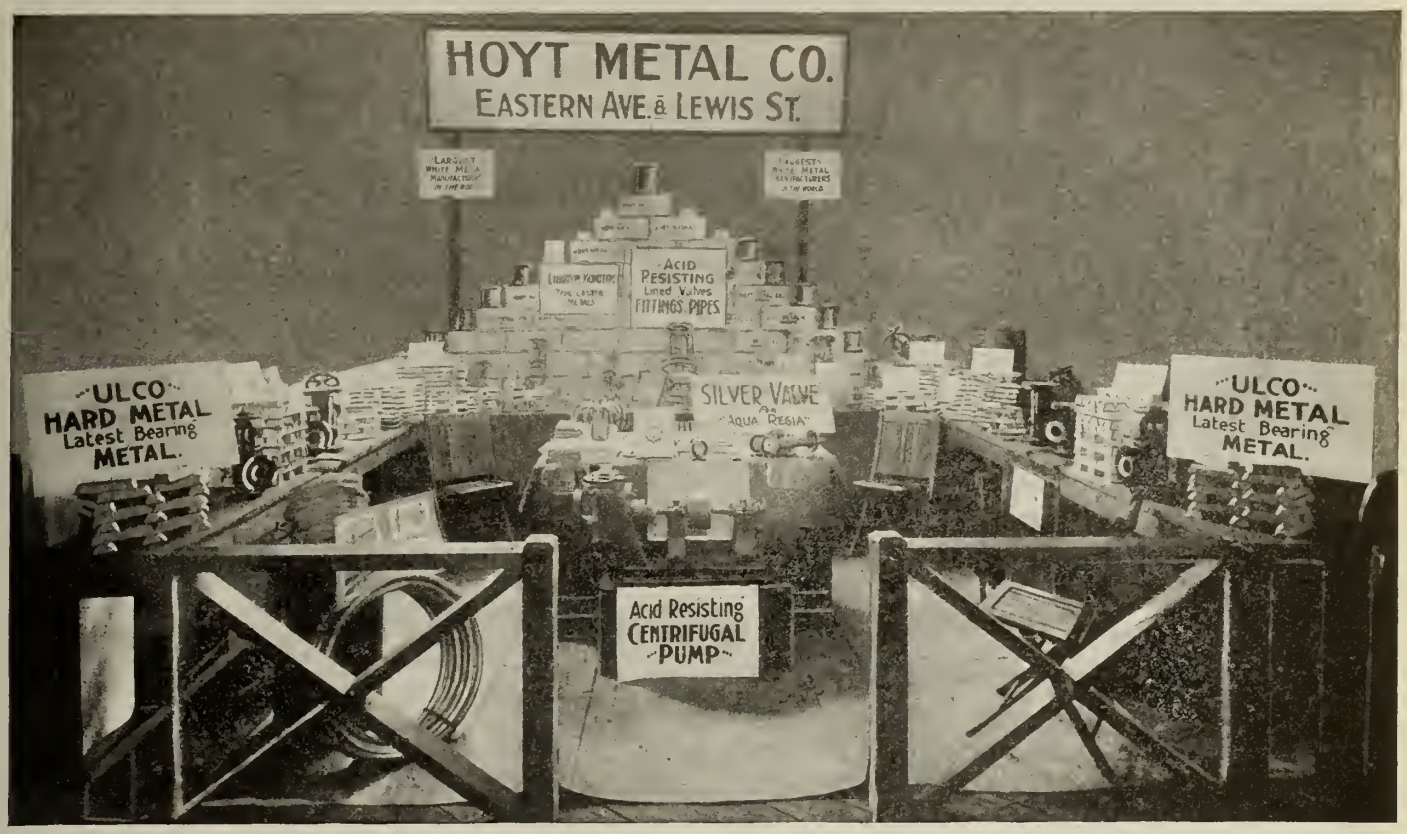
Steam Fitters and Heating Engineers, please remember that if you instal the BEST Boilers and Radiators, your customers will believe you are to be trusted in everything you do for them. Installing King Boilers and Imperial Radiators gives exceptional satisfaction, not only to your customers, but to yourself, and the wonderfully excellent service of this heating system serves to directly increase the good will of your business.



STEEL AND RADIATION, LIMITED

Head Office: Fraser Ave., Toronto
304 University St., Montreal

J. H. Ashdown Hardware Co., Winnipeg
St. Eustache and Joachin Sts., Quebec


HOYT METAL CO.
EASTERN AVE. & LEWIS ST.
ACID RESISTING Lined Valves FITTINGS PIPES
SILVER VALVE
AQUA REGIA
"ULCO" HARD METAL Latest Bearing METAL.
"ULCO" HARD METAL Latest Bearing METAL.
Acid Resisting CENTRIFUGAL PUMP

A NEW ONE FOR "EX" VISITORS

THIS year a new face appeared at the "Ex." or rather a new exhibitor. At the right hand side of the main entrance of Machinery Hall, visitors were greeted with the exhibit and attendants of the Hoyt Metal Co., Toronto.

Most hardware dealers and manufacturers have for the past few years associated the Hoyt people with the manufacture of Babbitts, solders, leads, etc., but few realized that their line consisted of the wide range of products which their display disclosed.

One of the main features of the Hoyt Metal Co.'s exhibit was "United" Lined Products—lead-lined, tin-lined, brass and copper-lined pipe and fittings, acid valves, centrifugal acid pumps, lead-lined chemical apparatus. This is a comparatively new line for Canada, but one which is in demand in the local market. Many were the interested visitors who stopped to inquire into the "United Process" of lining pipes, fittings and chemical equipment.

Another note-worthy line exhibited here was "Ulco" hard metal, a hard bearing metal of comparatively high tensile strength, with relative immunity to corrosion. It may be used in place of high-grade alloys such as those made of nickel, copper, bronze and tin, etc., and costs considerably less. "Ulco" hard metal can displace brass for many purposes where high tensile strength of bras is not an important factor. Beside these lines Frost King and other grades of Babbitts, solders, etc., were shown in a most complete range. The Exhibit was attractively gotten up and the attendants gave courteous attention to all enquires and distributed literature and catalogs bearing on the various lines on display.

There is no doubt the work done here will impress users of the above mentioned lines and result in good future business for the company. The best jobbers in all parts of Canada carry full stocks of Hoyt Metals and will be able to supply hardware dealers with all information regarding "Ulco" hard metal. Information re any of the above lines will be gladly sent direct or indirect.

SANITARY ENGINEER
PLUMBER AND STEAMFITTER OF CANADA

ESTABLISHED 1907 PUBLISHED TWICE MONTHLY

Vol. XIII. TORONTO, SEPEMBER 15, 1919 No. 18

CONTENTS

Fifty-three Years in One Stand 19-20

Regina Water Supply Comes in For Criticism 20

Central Station Heating in Detroit 21-24

What Others in the Trade Are Doing 25

Editorial Comment 26

Saving Fuel in Heating a House 27-29

News From Here and There 30-31

City of Chatham Considering Water Supply 31

Heating and Ventilating—

The Heating of Theatres 32-33

Ventilating the Modern School 34-35

Practical Sheet Metal Work 36-37

Market Conditions and Tendencies 38-40

The MacLean Publishing Company, Ltd.

JOHN BAYNE MACLEAN, *President.* H. T. HUNTER, *Vice-President.*
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Published on the First and Fifteenth of Each Month

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SPECIAL
BATH ROOM
EQUIPMENT
SUPPLIED FOR REST ROOM
H·R·H· THE
PRINCE OF WALES
· AT ·
CANADIAN NATIONAL
EXHIBITION TORONTO
BY US—
EVERYTHING FOR THE PLUMBER
THE CANADA METAL Co. LIMITED
TORONTO.
MONTREAL HAMILTON WINNIPEG VANCOUVER

The Plumber as a Salesman

"Wanted—A Salesman For Plumbing Supplies"—read the advertisement, and among the answers received were some from Master Plumbers, some of them very fine fellows, fairly well educated and who knew the Trade thoroughly.

They wanted, to use their own words, to better themselves and they thought the position as a Salesman offered a greater opportunity for advancement.

But is such really the case? Let us assume that the applicant obtains a position with a first-class plumbing supply house or manufacturer. He is no longer a free agent, he must conform with the rules of his house and to the established customs of the great fraternity of salesmen. He is expected to show initiative in promoting new business and great energy in developing the business which should naturally result from direct inquiries. He interviews everyone who does or is likely to require plumbing material and in the hardest kind of competition secures his orders.

Does his work cease when he turns his orders in to the house? Not so. He will find a hundred and one little matters that require to be adjusted and many of them have no connections with the sale as neither he nor his house have any control over the goods after they are delivered.

Suppose he remains as he is—a Master Plumber. He has the same ability and opportunity as a salesman. If he is progressive he knows all the work that is going on or can obtain the information from the same source as either the jobber or manufacturer. He has the same number of illustrations, the same literature and he has the same initiative, but he develops it on his own account.

He has the advantage of being able to sell direct to the consumer, personally interviews his prospect, visualizes the installation, and in his most interesting way describes the modern bathroom, the complete kitchen or convenient laundry equipment, and eventually closes the contract or makes the sale.

His interest, however, does not cease at this point. He is complete master of the situation, buys the material he specifies, has it installed under his supervision by clean and careful workmen, with the result that he is able to guarantee an absolutely perfect job which will be satisfactory to his customer and a future reference for himself.

Such a man is a salesman in every sense of the word. In addition to selling the goods, he sells service and in that line there is very little competition and price is not a factor in the transaction.

Our company's interest is, of course, in having its products properly installed. Plumbers tell us that they like our fixtures, that they have a nice clear color, are easy to clean, properly packed and convenient to install; but we know that no matter how good our ware is it is more attractive and becomes a better advertisement when it is properly installed by a good mechanic under the careful supervision of a Master Plumber who takes an interest in his work.

Just think what it would mean if every Master Plumber in Canada, and there are about twenty-five hundred, was a well-trained salesman and directed his energy and ability to sell plumbing material under the conditions we have set forth. The volume of business would increase and the conditions under which the work was done would be more profitable to the plumber and more satisfactory to the manufacturer and the consumer.

Port Hope Sanitary Mfg. Company, Limited

Factory:
PORT HOPE, ONTARIO
TORONTO SHOW ROOMS
119 King St. East

WINNIPEG OFFICE
405 Tribune Bldg.
HALIFAX OFFICE: McCurdy Building, Hollis Street

Head Office:
ROYAL BANK BUILDING, TORONTO
MONTREAL SHOWROOMS
234 Beaver Hall Hill

Established 1907 Circulates Throughout Canada

Sanitary Engineer
Plumber and Steamfitter of Canada

Published First and Fifteenth of Month

Vol. XIII. TORONTO, SEPTEMBER 15, 1919 No. 18

Fifty-Three Years In The One Stand

David Hall, Practical Plumber, Kingston, Ont., Now Owns Business and Premises Where He Started in to Learn His Trade—The Early Days and the Steps of Progress Which Have Followed

IT WAS fifty-three years ago when David Hall, then a boy of 13, first started in to learn the plumbing and heating trades in the stand where he now conducts his own splendid business in the city of Kingston, Ont. Yes, it is now his own business, and has been for a matter of over twenty years, his life work proving a successful one which has placed him in an independent position to-day.

Tells of Early Days

On the cards which Mr. Hall uses to-day, are the words: "Practical Plumber," and indeed he is just that. Mr. Hall, in a reminiscent mood, spoke of the early days when the plumber made his own traps and bends, when they handled brass work, making such lines as stop-cocks, copper pipe, etc., right in the shop. In fact Mr. Hall showed the writer a trap which he had made over thirty-five years ago, and a fine piece of workmanship it was. Mr. Hall also spoke of stop-cocks made in the shop over fifty years ago, which he knew were in service to-day. He told also of the time when he wiped 7 joints with four pounds of metal.

These were all interesting points brought out dealing with the early days but Mr. Hall does not live in the past. He is fully cognizant of the changes which have taken place and speaks as enthusiastically of the improvements which have been made to bring the trade up to to-day's high plane as he does of the days of his apprenticeship.

Lives in the Present

It requires a man with vision and initiative, too, to keep up with the van of progress. So many men who have been in business for half a century sour on their trade and always believe the past was best. Not so, however, with Mr. Hall. He realizes that progress has been made, and whereas he feels that perhaps the class of workmen to-day may not be as expert in many lines as those with whom he learned his trade, he is satisfied with the world as it is to-day in this speed age.

View of the display room of David Hall, practical plumber, Kingston, Ont. It was fifty-three years ago in this same stand where Mr. Hall started in to learn his trade. To-day he owns the business and the premises.

Son and Daughter There

Associated with Mr. Hall are his son, Charles H. Hall, and daughter, Helen Hall. Miss Hall looks after the books, does the buying, keeps the prices up to date, and is a big factor in the successful conduct of the business to-day. It can be seen from the list of her duties that they are vital, and to her keen judgment Mr. Hall attributes much of their ability to buy right and sell their goods and time at a profit. Miss Hall looks after the display room to quite an extent and handles much of the selling on the bathroom fittings, gas fixtures and other lines which they merchandise.

Mr. Hall's Story

Asked as to what he attributed his success to, Mr. Hall stated "service." "It may be an old term to use, but it is the foundation on which any business to attain success and continue along profit-making lines must build," stated Mr. Hall. "One may wonder why we don't go out and figure on many big contracts. Our plan is to get the business before it reaches a competitive stage. We sell our material and work on a 'satisfaction guaranteed or money back' basis, and you cannot get away from selling when you stand back of the work you do. We have customers who have been with us for years, and their continued satisfaction is the best advertising we can have."

They Came Back

Mr. Hall told some amusing experiences they had had with many of their customers. "There are any number who have left us—stated we charged them too much or some other excuse," Mr. Hall said, "but they have come back, and the reason they have come back is that we give satisfaction. The work we do has to be up to a standard, not down to a price. When you do business that way you get the class of trade that is profitable. When you do a cheap job it soon advertises the fact and you are given a black eye, with goodness knows how many people who might otherwise have been customers. The fact that the customer may have got all that he paid for has no bearing on the question—he only looks at the results, and when they are not right the man who handled the job is the one to blame."

Worthy of Best Efforts

And there is just a point there which might be given some consideration, too. Isn't the sanitary and heating profession worthy the best efforts of the men engaged therein. Why undertake work which is a "cheap John" job—it is no satisfaction to the man doing the work if he has any pride in his profession, and most certainly the customer will not be satisfied.

Carries Gas Fixtures

In addition to the sanitary and heating business which Mr. Hall does, he carries on an extensive trade in gas fixtures and fittings. In the early days Kingston was very largely dependent on gas for lighting, and a very large proportion of the houses are piped for its use. Those handling gas fixtures are growing fewer owing to the rapid strides of electricity, but Mr. Hall finds his trade keeping up splendidly. He is one of the very few able to supply fixtures and take care of the necessary work, and draws a big share of the business offering to-day.

Good Display Room

Mr. Hall has a splendid display room, as will be seen from the accompanying photograph. The various types of bathroom equipment are shown in addition to the gas fixtures and accessories. Bathroom fittings are displayed under glass in a nice wall case and make a splendid appearance.

Altogether David Hall, practical plumber, is a good type of business man to emulate. He understands his trade, he takes pride in his profession, he does a class of work which he labels "satisfaction guaranteed," and he charges prices in keeping with the class of work this motto entails. In spite of his years he is still a young man, and now enjoys watching his son and daughter handling the reins, although he still keeps an eye over things.

Regina Water Supply Comes in for Criticism

THE water supply of Regina, Sask., which for years has been recognized as inadequate to the needs of a growing city, has come in for criticism at the hands of the Regina "Leader," which says in a recent issue editorially:

"The problem of securing an adequate supply of good water has for many years agitated the minds of the people of Moose Jaw, and at the present time that city is face to face with the serious question of either obtaining such a supply or having the growth and prosperity of the city checked and even the health of its people endangered.

"To a lesser extent, Regina is confronted with the same problem. Unlike Moose Jaw, this city's present supply of water is all that could be desired from the standpoint of quality and purity as a drinking beverage, although it leaves something to be desired for industrial and other domestic purposes, being too hard and injurious in its effects on boilers. But Regina's supply is not what it should be from the standpoint of quantity, and if this city is to continue to forge ahead an energetic policy must be adopted and followed, having in view a very large increase in the amount of water available for daily consumption by its citizens and the industries which Regina ought to secure, and only can secure if a sufficieny of good water is guaranteed.

"It is probably quite true that there is available at the present source of Regina's supply sufficient water to meet the ordinary requirements of householders, and that it is possible to further increase that supply from time to time to meet householders' needs for some time to come. But Regina's City Council and citizens might just as well open their eyes wide to the fact that the present source of supply will not meet all the requirements of the city, industrially as well as for purely household purposes, if there is to be any substantial increase in our population and in the number of our industrial undertakings.

"At the present time Regina citizens are suffering from inability to get water for hours, if not days at a time, higher than the second floor in homes and business blocks, while the pressure even on the ground floor is reduced to such an extent at times that a mere dribble comes from the taps. The unusually dry season of 1919 may partly account for this. In addition we have the open confession of the city council that during the past few years it had neglected to give proper attention to the wells, with the result that there is not the flow of water there should be and that some of the wells are now in such a condition that it is open to question whether it would not be cheaper to abandon them and sink new ones rather than attempt repairs and the necessary cleaning of the old wells.

"But after making due allowance for these things, the fact must be recognized that during the war Regina secured, among her business enterprises, the great plant of the Imperial Oil Co., which is probably the largest consumer of water in the city, and which, coupled with the increasing quantities required by the three railways having terminals or divisional headquarters here, accounts for many hundreds of thousands of gallons a day. These requirements must be met, and met in an ever increasing amount, if Regina is to continue to grow and prosper.

"Even assuming that Regina can substantially increase the supply from present sources, and thus make good present requirements—which are not now being fully met—it would be folly to imagine that from the present springs we can secure sufficient water to adequately supply a Regina of 75,000 or 100,000 people, enjoying, as such a city would, scores of industrial concerns whose water consumption would necessarily be very large.

"Moose Jaw is right up against the water problem now. Regina is not far removed from it. It is high time, therefore, that these cities, working in conjunction with the Provincial Government, should quit speculating and talking and set themselves to the task of finding some practical permanent solution of the problem which confronts them."

Central Station Heating in Detroit

The Author in a Paper Read Before the American Society of Mechanical Engineers in Detroit Describes a Successful Central Station Heating Installation in Detroit

By J. H. WALKER

ONE of the natural results of the grouping together of human beings in civilized communities is the existence, in our cities, of central plants for the generation and distribution of heat to surrounding buildings. The advantages of central heating service to the user, over the alternative of operating a heating plant in his own building, are comparable to those accompanying any other public service. To the community also a properly operated central heating plant is a distinct asset, commercially and economically.

The Utilization of Exhaust Heat

The heat carried away by the condensing water in the central electric stations of the United States, equivalent to about 60 per cent. of the total fuel burned by them, is one of the more obvious, although not by any means the greatest waste, of the country's resources. Like many other similar losses this one exists, not because its reduction is theoretically impossible, but because it is seldom commercially practicable. But although commercial considerations have always dictated certain practices in the utilization of fuel and will continue to do so in the future, the increasing cost of coal and the present impulse towards its conservation now direct attention to some of the fundamental problems involved.

This great quantity of heat, rejected at low temperature from the generating units, may be considered as a by-product of electricity supply and as such its rate of production will depend upon the rate of production of electricity, the primary product. The complete utilization of any by-product becomes possible only when an outlet for it exists or can be created. Moreover, since neither electrical energy nor heat can be stored to any great extent, it is necessary for the complete recovery of this by-product that the demand for it be equivalent, hour by hour, and day by day, to the rate of electricity supply. The warming of the interior of buildings is, of course, a natural means of utilizing this heat, but the great diversity in the rate of use of the two commodities renders impossible even an approximately complete realization of the theoretical economy.

The possibility of establishing a better relation between the rates of use is rather slight. The rate of heat supply is largely fixed by unalterable climatic conditions. The use of electricity for lighting is also governed by natural elements. The demand for electricity for industrial use, which now constitutes a major fraction of the output of most central stations, is not governed by these factors and is the only kind of load whose characteristics could conceivably be adjusted to suit the requirements for exhaust heat, and even this could probably not be done to any practicable extent.

Another important obstacle to the full use of this by-product heat through the warming of buildings is due to the great development of the central electric stations which in many industrial centres in the United States have so increased in size that the amount of exhaust heat which would be available as a by-product

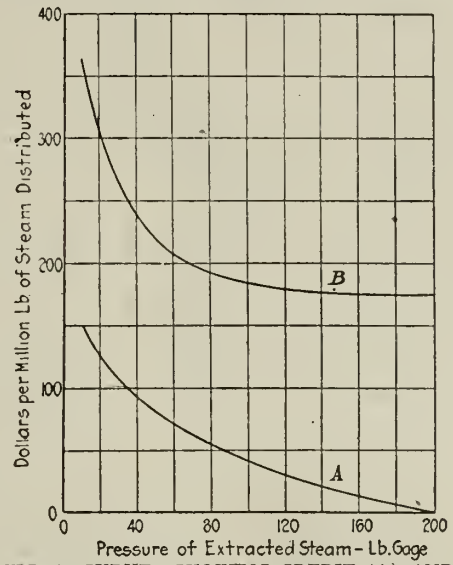

FIG. 1—CURVES SHOWING CREDIT (A) AND DEBIT (B) TO BLEEDER TURBINE PLANT FOR VARIOUS EXTRACTED STEAM PRESSURES.

is greatly in excess of that which it would be commercially feasible to distribute for the heating of buildings.

Systems of Central Heating

Assuming that a central heating load exists and is to be supplied by the electric company, there are in general three methods by which this can be done:

(a) The heating load can be served from a condensing generating station so designed that steam is available for heating at pressures above atmospheric after partial expansion in the electric generating units, the remainder of the steam used for current generation being fully expanded and condensed at high vacuum.

(b) Separate heating plants may be built in locations near the heating load and equipped with non-condensing generating units which will generate current only to the extent of the requirements for exhaust steam for heating, the remainder of the electricity being produced in a condensing station.

(c) The heating system may be supplied entirely with live steam from boiler plants located near the centre of the heating load.

It may so happen that the natural location for the main generating station serving a city is near the heating load, and if this is the case, the first method is preferable. In such a plant the use of bleeder turbines, designed so that steam can be extracted from the intermediate stages after partial expansion, offers great advantages. This arrangement has been successfully carried out in some instances and is probably the nearest possible approach to ideal conditions, since the duplication of equipment is reduced to a minimum.

Often, however, a consideration of land values or of railroad connections requires that the main condensing station be located at such a distance from the heating load as to preclude the possibility of transmitting steam from it. The Delray plant and the Connors Creek plant, the two main generating stations operated by The Detroit Edison Company, are respectively 3½ and 4½ miles from the heating district. A condensing plant, located on high-priced land near the heating district and with inconvenient railroad connections, or none, would be necessary if this first method were to be used. To such a plant, built for electricity supply and consequently, for reasons previously stated, burning more coal than a plant built solely for heating, this matter of proper railroad facilities is particularly important. Here again enters the matter of the transmission of steam, for seldom could the bleeder-turbine plant be located as favorably with reference to the heating load as could live steam plants, and the additional investment in transmission lines must therefore be charged against this plan.

The size of the pipes required to transmit a given quantity of steam over a given distance decreases as the density of the steam and the amount of pressure drop along the pipe increase. The most economical method from the standpoint of investment costs would be to extract steam from the high-pressure stages of the turbine; but the amount of electricity which could be generated per pound of steam would then be reduced. The relative values of these factors for an assumed river-front bleeder-turbine plant in Detroit are illustrated by the curves in Fig. 1. Curve A shows the total credit for the saving in coal and boiler capacity which could be allowed such a bleeder-turbine plant located on the river front and serving the existing Detroit heating system. Curve B shows the total

of the additional investment charges due to the higher-priced land on which the plant would be built, plus the investment charges and line losses involved in transmitting the steam from this river-front plant to the centres of the heating load. Even at higher extraction pressures the bleeder plant would not be justified under Detroit conditions because of its unfavorable location with respect to the heating load.

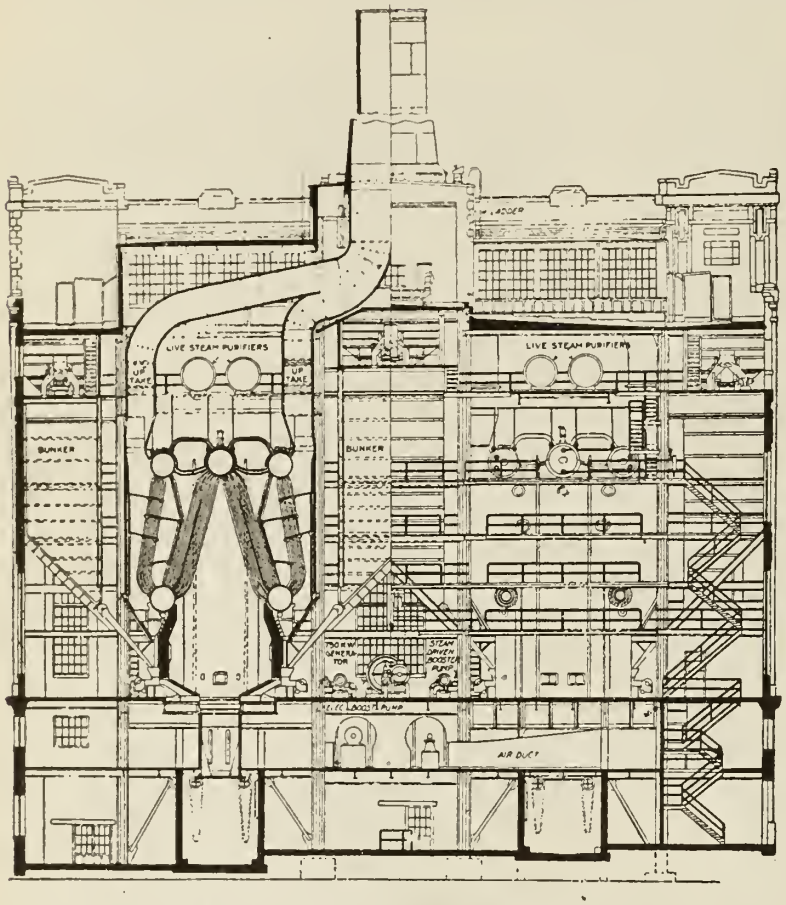

FIG. 2—CROSS-SECTION OF THE CONGRESS STREET PLANT.

The second plan above mentioned, namely, the building of plants located near the heating load and generating current only to the extent of the exhaust-steam requirements, involves somewhat different factors. In this case the capacity of the generating units will be determined by the heating requirements and the electricity generated by them will be the by-product. An essential requirement for the success of this plan is that the relation of these generating units to the electrical system as a whole be such as to allow their loads to be adjusted without restriction according to the momentary requirements for exhaust steam.

The value of such current as the heating plant will produce will be determined largely by the cost of producing an equal amount in the condensing stations. If the condensing stations do not produce current at an extremely low cost and, if other conditions are not unfavorable, this plan may prove very attractive and is in fact the mostly widely used method of combining the electrical and steam-heating plant. But unfavorable conditions surrounding the production of this relatively small amount of current may render its cost unattractive. The size of such generating units as might be installed in the heating plant may be so insignificant compared to the large size of the units in the condensing plant that the investment in the main station is not measurably reduced and the smaller units are therefore additional investment. The investment in steam-distribution mains is also much greater than when steam at higher pressures is used.

Development of Central Heating in Detroit

The immediate motive which, in 1903, led to the establishment of the central heating industry in Detroit was the possibility of obtaining a high thermal efficiency in the generation of electricity through the utilization of the exhaust steam. The generating plant from which steam was first supplied for heating had previously discharged its exhaust to the atmosphere. Owing to the building, at this time, by the Detroit Edison Company, of a large condensing plant, the smaller plant, with several others, would have been shut down, but the possibility of selling the exhaust steam made it appear desirable to continue the generation of current there to the extent of the exhaust steam requirements. Also, since the plant was located in a district served with direct current, the loss involved in converting an equivalent amount of alternating current received from the main plant to direct current would be saved for such current as might be generated there. The plant was in a high-class residence district and the heating service proved very popular, but the actual overall economy of the plant was not as great as had been anticipated.

A year later the construction of a central heating plant was begun in the business district of the city. This second project was undertaken, not as a means of disposing of exhaust steam, but for the express purpose of supplying the demand for central heating service among the owners of downtown buildings, who were considering shutting down their plants and purchasing electric service. The downtown plant was built primarily as a heating plant, and though provision was made for electric generating units they were never installed and the heating mains were supplied with steam from the boilers through reducing valves.

With the development of the large condensing generating stations the generation of current in the heating plants grew less and less attractive and when a third heating plant became necessary, because of increasing demand for steam heat, no provision was made for electric generators. The same practice was followed when, in 1916, the original exhaust-steam plant was rebuilt; and when the steam-distribution system of another company which had been engaged in the generation of electricity and the distribution of exhaust steam in the business district was purchased by the Detroit Edison Company, the new plant which was built to supply this district was also designed as a heating plant only. The entire combined distribution system is now being supplied with live steam from the boilers through reducing valves.

Since there are no generating units exhausting into the heating system the pressure carried on it is not limited by considerations of back pressure. On those sections of the system formerly supplied with exhaust steam at from 2 to 5 lb. pressure, the pressure now maintained ranges from 5 to 15 lb. and is being increased from year to year, toward the upper limit permitted by the strength

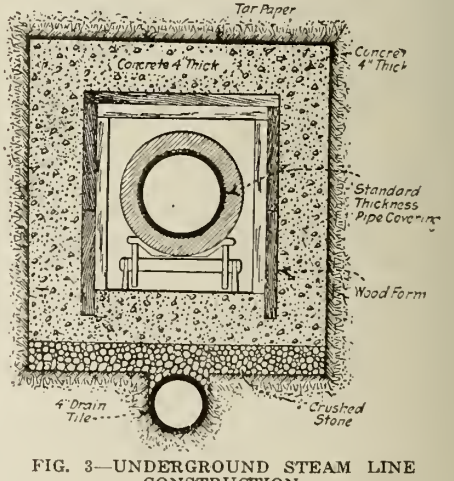

FIG. 3—UNDERGROUND STEAM LINE CONSTRUCTION.

of the pipes. The pressure on the section originally designed as a live-steam system is about 30 lb. Because of the increased capacity of the distribution system at higher pressures, due to the greater density of the steam and the greater allowable pressure drop, these higher distribution pressures are desirable.

The steam is delivered to the network of mains through connections made at the plants and also through feeders, from the plants which deliver steam to certain feeding points in the distribution network, the method being similar to the feeder and main method employed in electric-distribution systems.

Reasons For Using Live Steam

The supplying of live steam to the heating system and the abandonment of the generation of current in the heating plants is commercially justifiable, even though such current would be generated at a high thermal efficiency. The underlying reason for this is that there exist certain unfavorable conditions which outweigh the thermal advantage and make the total cost of such current higher than the generating cost at the large and efficient main generating stations.

The method of live-steam operation was adopted in Detroit before the recent great advance in the price of coal. The present high price of coal makes exhaust-steam operation appear somewhat more favorable and it is, of course, conceivable that at some future date a very high coal price may compel a change of policy. But with the cost of underground lines also increasing, the saving in distribution investment will probably continue to be sufficient to justify a continuation of the present methods.

Distribution System

The popularity of the heating service in Detroit has led to its development on an extensive scale. The present distribution system covers an area about 2 miles long and half a mile wide which includes the entire central shopping, business, and financial districts and a small portion of the residence district. About 2,700,000 sq. ft. of radiation, besides numerous water heaters and cooking fixtures, are served. The distribution system contains about 20 miles of tunnels. The four boiler plants which supply steam to the system contain 17,470 rated boiler horsepower, and they delivered in 1918 nearly two billion pounds of steam to the system. Over 1,700 consumers are served.

Though originally built in three distinct sections, the system is now a practically continuous network, and the plants are so much interconnected that the load can readily be shifted from one to another. In the spring and early autumn two of the four plants were the entire area.

The four boiler plants in Detroit which supply steam to the heating system are equipped with water-tube boilers and underfeed stokers and are of modern design throughout. Their location in the central district of the city necessarily restricts the amount of land which they may occupy and demands a suitable type of architecture, absolutely smokeless operation, and extreme cleanliness in the handling of coal and ashes.

A cross-section of the Congress street plant, the newest of the four, is shown in Fig. 2. It is designed to eventually contain four 1,300-h.p. boilers and two 2,600-h.p. boilers of the "W" type. In the effort to reduce the amount of attendance labor at this plant the auxiliaries are located, for the most part, on the boiler-room floor so as to be within convenient reach of the few men constituting the operating crew. Coal is hauled from bunkers at the railroad sidings to the plant in drop-bottom buckets of 5 tons capacity, which are lifted by a crane and emptied into overhead hoppers from which the coal is distributed by belt conveyers to the boiler bunkers. Ash-handling equipment is practically nil, the boilers being set at a sufficient elevation to allow wagons to be driven beneath the hoppers.

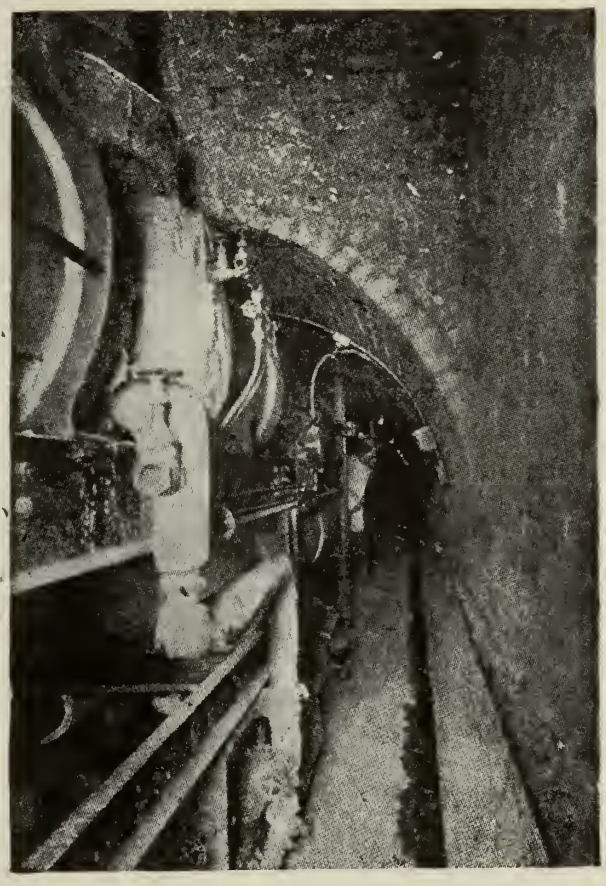

FIG. 4—TUNNEL CONSTRUCTION FOR STEAM LINES.

Because of the fact that only a relatively small amount of condensation is returned to the plants, careful treatment of the raw water is necessary. The feedwater flows through live-steam purifiers, operating at boiler pressure, in which the scale-forming materials are precipitated. In addition, sodium carbonate is fed in automatically graduated amounts to reduce the slight amount of hard scale-forming material which finds its way into the boiler. Although Detroit water is not a bad boiler water, these precautions are necessary because of the large percentage of make-up water and the rather high rates of steaming at which the boilers are sometimes driven.

The auxiliaries are almost entirely motor driven. The current is supplied by a 750-kw. turbo-generator unit exhausting into an open feedwater heater. The load carried on this generator is adjusted according to the requirements for exhaust steam for heating the feedwater and any excess current generated is delivered to the outside electric-distribution system. Conversely, if the electricity requirements of the plant exceed the output of the generator, current is drawn from the outside supply. Exhaust steam is thus made available for heating the feedwater and the advantages of motor-driven auxiliaries are also secured. Moreover the turbo-generator constitutes a source of electricity supply for the plant in case of local interruption of the outside service.

Steam is generated at a pressure of 130 lb. gauge. This pressure is chosen in order to provide for considerable pressure drops in the outgoing feeders as calculated for present conditions. It may be raised to 160 lb. at some future date. The outgoing steam lines leave the plant through a tunnel shaft.

Feeders

Because of the great increase in connected load the transmission capacity of the distribution network, most of which was installed several years ago, is now quite inadequate. To have raised the pressure throughout the system would have increased its capacity; but the system pressure was permanently limited by the fact that most of the underground fittings are of a low-pressure pattern, and temporarily by the fact that in those sections of the system formerly supplied with exhaust steam the customers' installations are not provided with reducing valves Instead of attempting to change these conditions, which would have involved the reconstruction of much of the distribution network, the less expensive plan was adopted of running feeders from the plants to various centres of distribution. In selecting the pipe sizes for feeders, advantage is taken of the difference between boiler pressure and distribution pressure, and the size of the pipe is so chosen that at times of maximum load much or even all of this pressure drop will take place in the pipe itself. The diameter and the cost of the pipe line are thus materially reduced. In operation, the pressure of the steam de-

livered to the feeder is raised or lowered as required by the adjustment of a reducing valve at the plant, in order to maintain a constant pressure at the centre of distribution which the feeder supplies. The pressure existing at this centre of distribution is recorded at the plant by a long-distance gauge, electrically operated.

The velocity of the steam flow in the feeders at times of heavy load is very high. Velocities as great as 75,000 ft. per min. have been measured. This high velocity does not appear to be at all objectionable, however, there being no apparent erosion of the pipe and no hammer, or objectionable vibration. The fact that the steam is in a superheated state because of the pressure drop is an advantage in these respects. Feeders are constructed with long radius bends and where the connection is made to the distribution mains the diameter of the pipe is gradually increased by special taper fittings so as to reconvert a portion of the velocity head to static pressure.

A considerable pressure gradient is also allowed to take place in the distribution mains as well as in the feeders; but this is relatively small, since the upper limit is fixed by the allowable working pressure of the older mains. The more recently laid mains are capable of withstanding a working pressure of 125 lb. and the gradient in the mains can therefore be increased at some future date. From a standpoint of safety, however, the desirability of carrying pressures in excess of about 50 lb. on the service connections to buildings is questionable until further development in pressure-reducing apparatus is made.

This method of steam distribution is obviously an adaptation to previously existing conditions and would doubtless be modified if an entirely new system were being laid out.

Underground Construction

The distribution mains range in size from 20 in. near the stations to 4 in. at the outskirts of the system. The original underground pipes were laid in a segimental wood casing bound with wire. This construction has been fairly successful under favorable soil conditions, but the concrete conduit shown in Fig. 3 has been found to be superior in many respects and has been used exclusively for several years in all new construction. In this construction the pipe is insulated with a standard thickness of pipe covering and surrounded with an envelope of concrete poured over a wooden form, leaving an air space around the pipe. Proper underdrainage is of course essential.

The longitudinal expansion and contraction of the pipe, due to changes in its temperature, are absorbed, in the earlier construction, by means of expansion fittings of the copper-diaphragm type. In recent construction a slip joint, consisting of a brass sleeve, sliding in a packed gland, has been used. The use of slip joints decreases somewhat the cost of the pipe line as they will absorb more travel and can be placed at wider intervals than the diaphragm fitting.

The underground mains have not been laid sufficiently long to permit of an accurate estimate of their life. The oldest lines laid in wood casing have now been in service 15 years and, while the casing in many places has deteriorated considerably, in other places it is in fairly good condition. The concrete construction, dating back 10 years. seems to have deteriorated very little. The only repairs or replacements which have been made to date have been made necessary by external corrosion or pipe arising from some outside and local cause such as a water-pipe leak. An average life of 20 years for the wood log construction and 30 years for the concrete construction would seem to be a very conservative estimate. Soil conditions in that part of the city where the heating mains are laid are particularly favorable, the soil being very well drained. Manholes are located at intervals of about one city block (300 to 400 ft.), to house the slip joints, valves and bleeder traps.

In the heart of the business district the pipes are in tunnels, of which there are about 2 miles, lying from 25 to 40 ft. below the street level. In cross-section they are similar to a horseshoe and are built of brick, with concrete floors. (Fig. 4). For the most part they are about 6 ft. in heiht and 6 ft. wide. The tunnels are ventilated by suction fans which draw a small amount of air through them continuously and much larger amounts when it becomes necessary for men to work in them. Their temperature ranges between 90 and 130 deg. Fahr. When two or more pipes are to be laid under a street in a congested district it has proved desirable to build a tunnel to avoid the inconvenience to the public attendant upon tearing up the street, either for the original construction work or for subsequent changes. The tunnel permits of ready access to the pipes at any time, and since it is far below any other structures, no obstructions are met with. Tunnel construction is exceptionally simple in Detroit where the subsoil is a blue clay nearly impervious to water and well adapted to tunneling operations. The cost of tunnel construction is high, but the advantages gained are compensatory.

Distribution Losses

Distribution losses from various sources are considerable. Heat losses from the mains are the principal item. This loss can be controlled within limits in designing the system of the application of the proper amount of insulation, so as to produce the most economical relation between heat loss and investment costs. Besides the condensation losses in the mains and service connections, there are losses due to the leakage of steam from consumers' piping and air valves, and loss due to the escape of unmetered condensation, and the slip of meters. About 80 per cent. of the steam delivered by the plants is metered as condensation in the consumers' buildings. This figure compares favorably, considering the nature of the business, with the efficiency of electrical distribution. In 1918, for example, the ratio between the electrical plant output and the consumers' meter readings for the Detroit district was 83 per cent., the large items of loss being transmission, transformation and conversion.

The condensation from the buildings

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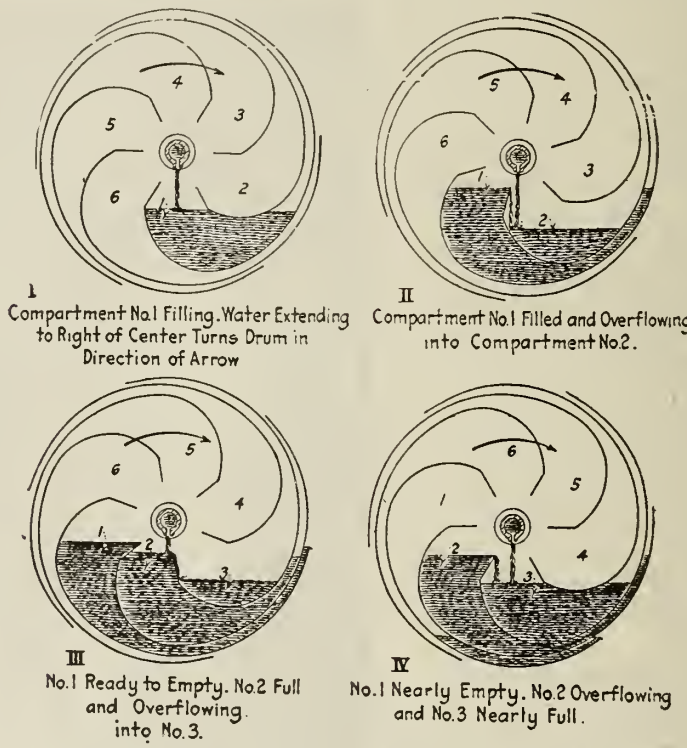

I
Compartment No.1 Filling. Water Extending to Right of Center Turns Drum in Direction of Arrow
II
Compartment No.1 Filled and Overflowing into Compartment No.2.
III
No.1 Ready to Empty. No.2 Full and Overflowing into No.3.
IV
No.1 Nearly Empty. No.2 Overflowing and No.3 Nearly Full.

FIG. 5—CONDENSATION METER AND PRINCIPLE OF OPERATION.

What Others in the Trade Are Doing

How Plumbers All Over the Dominion Are Keeping Their Names Before the Public —There May be Many Hints in Some of These Advertisements Which You Can Use With Good Results When You Are Arranging Your Own Copy

A. E. LAW, **Leamington, Ont.**, in a single column advertisement, illustrated at the top by an illustration of a gas water heater, says: "Hot water in summer is essential to good health, comfort and sanitary cleanliness. It's easy to have, costs little, and takes but a few minutes if you have one of our gas heaters. They consume but a small amount of gas, are clean, economical and in every way satisfactory. ASK US FOR PRICES.

P. Atkinson, **Preston, Ont.**, in a single column ad three inches deep, says: "Plumbing, steam and hot water heating. First-class workmanship guaranteed. Estimates given. Jobbing promptly attended to. Phone 19."

D. J. Shea, **Fredericton, N.B.**, in a double column ad. 2½ inches deep shows an illustration of a heater and in display type says: "A wickless kerosene heater, just the same in its heating principle as the gas water heaters, except that the gas is generated from kerosene. Steady, even, powerful blue flame, no wick, no odor, no dirt. Call and examine them."

Adam Clark, Halifax, N.S., in his advertisement, says: "Now is the proper time to have inspection and contemplate alterations made to your HEATING AND PLUMBING. Do not leave it until the fall when the rush is on. Heating, plumbing, ventilation, sprinkler systems."

Victoria Plumbing Co., Ltd., Victoria, B.C., in a neat two-column ad. with a border all round, says in display type: "WE DO NOT CHARGE FOR ESTIMATING. Try us on your next job. Materials and workmanship guaranteed. Phones: 3402, night, 1450L."

Theal Bros. & Moxley, Grimsby, Ont., in a single column advertisement, all in display type, announce that: "POOR PLUMBING MEANS WASTED MONEY, WASTED TIME, WASTED HEALTH. WE SAVE YOU THESE. PHONE 21."

Weldon Carter, Summerland, B.C., in a two-column announcement two and a half inches deep, says: "Weldon Carter, plumber and heating engineer, with a larger stock of supplies and material and more help, I am now in a much better position than ever before to attend to your orders for plumbing, heating, etc."

I. N. Watson, **Creemore, Ont.**, in a single column ad. 2½ inches deep says in display type: "Plumbing, tinsmithing and repairing. Pipe fitting of all kinds done. Furnace work a specialty. Give us a call. Phone 92."

Mainer & Bartindale, Orillia, Ont., in an advertisement five inches square illustrated with a bath into which the water is seen pouring through open faucets, and under the heading in large type "PLUMBING" says: "We supply quality goods and instal them in the best manner, and our prices are right. Get our prices on WIRING. We have a first-class electrician to look after your needs. Remember, we sell fixtures, lamps, bulbs, etc. FURNACES—Look to us to clean and repair your furnace now. It ruins your furnace to leave it in a dirty state all summer and rots and rusts it out. We also look after the repairing of your roofs, eavetroughs, etc. Call us at Phone 124."

Pitt Bros., Regina, Saskatchewan, in an ad. five inches deep and six inches wide show an illustration of a hot water boiler with pipes, etc. Under the heading, in display type, "MR. BUILDER, MR. FARMER," they say: "If you are intending to instal a hot water or steam plant, also plumbing in your building, in the city or country, call, phone or write and we will gladly submit you an estimate free of charge. A few of the numerous plants installed in the country (here follows a list of fourteen names and addresses). Plumbing installed in the country under Government supervision. ALL WORK GUARANTEED. Phone 5012."

Simmons Bros., Kingston, Ont., under the heading in display type, "TO INSURE GOOD PLUMBING" in a double-column advertisement, three inches deep show an illustration of a workman installing a bath and say: "To insure good plumbing get a good plumber. If you procure fine fixtures, then have them installed by slipshod plumbers, you are only half right. All plumbers are not good mechanics even though they claim to be. But if you come to us we assure you good fixtures, good workmen and the right price."

Adair, The Plumber, Kincardine, Ont., in a two-column announcement five inches deep says: "Adair, the plumber, is now settled in his new and up-to-date quarters in E. Miller's old stand, south of the Morgan House, and invites the public to call and inspect the well-assorted stock of plumbing supplies he has in stock. NO ONE CAN AFFORD TO FUMBLE WITH PLUMBERS. That's logical. That's why we are always on the lookout to protect our customers' interests in the way of acquiring good workmanship and materials. We aspire to give our customers the two greatest factors above mentioned, coupled with our always ready, six-days-a-week service. We aim to please. Are you going to rod your barn or house, Mr. Farmer? If so let us demonstrate to you the superior qualities of ——— lightning rods. Repairing of all kinds solicited. ESTIMATES FURNISHED on plumbing, heating, eavetroughing and everything in the tinsmithing line."

Union Plumbing and Heating, Estevan, Saskatchewan, in a double-column ad. five inches deep says in display: "Plumbing, heating, tinsmithing. Specialty in repair work. We are in a position to quote to the farmers and trade, the lowest prices on plumbing and tinsmithing. Estimates free. District agents for ——— furnaces."

Selkirk Bros., Montreal, make the following announcement: "PLUMBING—prompt and economic service; stoves repaired quickly, furnaces inspected. Contract work solicited. Phone St. Louis 350."

Frank & Shuett, Guelph, Ont., in a double-column advertisement 1½ inches deep say: "EXPERT PLUMBING AND TIN SHOP. When requiring plumbing, heating and tinsmithing, furnaces cleaned, repaired and installed; repairs to stoves, pipes, and all classes of tinware: felt, gravel and iron roofing; eavetroughing and metallic roofing—call in or phone 362."

A. J. Wise Heating and Plumbing Co., Toronto, say in their advertisement: "BEWARE. Don't wait for cold weather to have your heating system overhauled. Consult our experts. Just call H610. No job too distant. No service too great."

A. L. McKay, Semans, Saskatchewan, in a double-column advertisement with black border all around says: "SANITARY PLUMBING, STEAM AND HOT WATER HEATING. We are always pleased to advise you or give you an estimation on the cost of any system you are thinking of installing. For information see J. Dutton, or phone or write A. L. McKay, Plumbing and Heating Engineer."

EDITORIAL COMMENT

THE GET-TOGETHER SPIRIT

EVIDENCES of a better relationship between employer and employee are not lacking in spite of the many strikes which have been called and that threaten. This is shown in welfare schemes and insurance plans being instituted by many firms for the benefit of their employees. But it is not solely for the benefit of employees, as these employers have realized. They appreciate that a satisfied employee is an asset and are taking steps which will encourage an employee to stay with them and develop their abilities in the interests of the employer. This means the development of experienced help by which production can be increased. Greater production is the crying need of the day to bring about a readjustment from the present high scale of living. The growth of these get-together schemes is an omen for good; let us lend them every encouragement.

THE HIGH COST OF STRIKING

JUST how many strikes are on and are threatened throughout the world to-day it is impossible to say, but it is certain that at no time in history have strikes been so common or so widespread. It is impossible to pick up a daily paper now without finding the word "strike" figuring prominently in the headlines. One of the chief causes of the walkouts is usually given as the high cost of living. Not very much is said though about the high cost of striking. Every time a man strikes and every man who strikes increases the cost of living. He may get a few dollars a week more in wages, but this simply means that the cost of whatever product he is making advances and his fellow workers have to pay it. Then they strike and get more wages, and the man who first went out has to pay more for the commodities his fellow men are making. This sort of thing has been going on so continuously that everyone is affected by the high costs. This has been added to not only by higher wages, but by shorter hours and limited production. Prices cannot come down until there is a surplus of goods. What is needed is more production, not less. If by some miracle production could be brought up to the point where the world's needs could be supplied prices would quickly readjust themselves. One of the regrettable things about most of the strikes is that they never would have happened if both sides had got together and talked things over and understood the other's difficulties and tried to allow for them. Figures which are available for the recent strike of the miners in Yorkshire, England, show that in damages to the mines, coal lost to industry and losses to other industries, the total was $37,500,000. The miners' strike fund, which amounted to $1,400,000, and had taken them 25 years to accumulate, was completely exhausted. And all because there was a misunderstanding over a few clauses in an agreement and neither side would get together and talk things over. It is obvious that this sort of thing is ruinous in its results and is bad for trade, bad for the people directly concerned and bad for the nation.

WE CAN'T AFFORD THIS

CANADA'S fire waste in spite of our enormous resources is suicidal, and if continued means only one thing, an enormous and unnecessary drain upon every man, woman and child in the country. Because it does not appeal to them personally, the great majority of people fail to realize that they suffer every time there is a fire loss. The whole country is just that much poorer every time property is destroyed. It can never be replaced. The insurance companies may pay for it but they cannot bring it back and the great mass of people provide the insurance companies with the money. Every merchant who carries insurance provides for it in his overhead and the consumer pays. Last year Canada's fire losses were almost $34,000,000. This year it is not expected they will be quite so large. One of the reasons for the reduction is the attention that is now being given to the problem of checking fires. Every hardware man in the country can do his share in this good work and it is to his interests to do it. There are many ways of helping and as soon as everyone realizes what a criminal waste is taking place and does his share in stopping it, just so soon will Canada's fire loss cease to be the largest per capita fire loss in the world.

EDITORIAL BRIEFS

BETWEEN 1901 and 1919, Canadian workers lost over 14,000,000 days through strikes. Even at $3.00 per day this represents over $42,000,000 in wages, not to count the loss in production, interest on capital involved, etc. Strikes are, therefore, a factor in the high cost of living which should not be overlooked.

Saving Fuel in Heating a House

By L. P. BRECKENRIDGE and S. B. FLAGG

THE total output of coal in the world during the calendar year 1913, according to a Government report, was 1,443,393,052 short tons and of this enormous amount 39.5 per cent., or 570,048,125 tons, was mined in the United States. Probably 10 to 15 per cent. of the coal produced in this country went to purchasers who used it largely for heating dwellings. The Federal Government uses a large quantity of coal for heating the many small buildings occupied by its various departments and bureaus, and is therefore directly interested not only in selecting proper fuels, but in obtaining the best possible results from their consumption. Because of this interest on its own account and the widespread interest of householders the Government some years ago conducted tests to determine the relative value, for use in residence-heating boilers, of several typical fuels.†

The value a householder gets from the fuel he burns depends largely on the character of the heating apparatus, the conditions under which it is installed, and the manner in which the fire is handled. The authors, from experience in firing residence-heating apparatus and from observing the methods employed by many who attend to such apparatus, keenly appreciate the importance of proper firing methods, and have written this paper in the belief that some general remarks on the selection, care and operation of residence-heating apparatus may prove of value to many who are interested in burning fuel in the most economical manner.

This is the third instalment of the fourth of the series of Engineering Bulletins issued by the United States Fuel Administration in collaboration with the Bureau of Mines, Department of the Interior. This series is receiving very favorable comment. In this concluding instalment on "Saving Fuel in Heating a House," "General Suggestions on the Firing of Coal, etc., are dealt with. This fourth article covers the saving of fuel in house heating thoroughly and should appeal to every heating engineer. This is the last instalment. Keep them all for reference.—EDITOR'S NOTE.

General Suggestions on the Firing of Different Fuels

FUNDAMENTALLY, the process of combustion is the same for all fuels. Whether the fuel be wood, coal, or oil, heat is produced by the carbon or other combustible elements combining with the oxygen of the air. The oxygen and these combustible elements unite in certain proportions at certain temperatures and a definite quantity of heat is evolved in each case. Some of the heat is absorbed by other parts of the fuel, heating them to ignition temperature, and some of the heat is absorbed by the nitrogen in the air supplied—ordinary air contains about 80 per cent. nitrogen—and by the gaseous products of combustion, raising them to a high temperature. Part of the heat radiated from the glowing fuel or conveyed by the hot gases passes over the heating surfaces of the boiler or furnace, is taken up by the water or air heated, and is distributed to the rooms of the house.

The admission of more air through the fuel bed or fire door than is required to furnish the oxygen necessary for complete combustion tends to cool the fuel bed and the gases that rise from it. As oxygen unites with combustible elements in definite proportions, the theoretical amount of oxygen and hence of air needed for the complete combustion of a given weight of coal can be computed. However, in burning any kind of fuel on a grate, considerable heat is lost in unburned material if only the quantity of air theoretically required be admitted, because it is practically impossible to get all of the particles of combustible matter in the fuel to unite with all the particles of oxygen in the air theoretically required. An excess of air must always be supplied, but this excess should be neither more nor less than is necessary to insure complete combustion.

The importance of providing an inlet for the air that must enter the furnace room is frequently overlooked, especially in small, tightly-closed furnace rooms. Roughly, 150 to 300 cubic feet of air are required for each pound of coal burned, and, to prevent trouble from insufficient draft, some means for admitting this air to the furnace room must be provided. Usually enough air leaks into the furnace room through cracks and poorly fitting windows, but the tighter the construction of the room the greater the need of an air inlet.

The suggestions following have to do especially with preventing incomplete combustion and the admission of a large excess of air into the furnace, and the minimizing of the attention necessary to maintain the proper temperature in the rooms heated.

Regulation of Draft

Whatever fuel may be selected, convenience will be promoted by having the heater large enough to maintain for at least eight hours, without attention, proper room temperatures under any weather conditions, except the most severe. If a heater will not do this, it is too small or the draft is insufficient. Satisfactory regulation of the fire will be facilitated by a proper equipment of dampers, including (1) a hand damper in the smoke pipe; (2) a check damper, also in the smoke pipe, and (3) a damper (preferably a lift damper) in the ash pit. The ash-pit damper and ash door as well as the pit itself should be so made that the supply of air under the grates can be entirely cut off by closing the door and damper, otherwise proper control of the fire will be difficult if not impossible. This is a point often neglected. If bituminous coal is to be burned a lift damper in the firing door is advisable. Slight explosions of combustible gas sometimes occur in the furnace after fuel has been put on and unless the firing door is provided with a lift damper which can open and relieve the pressure, the door itself may be blown open.

Whether the fuel be hard or soft coal, coke, or wood, the stack damper should be kept partly closed at all times except in severe weather, unless the conditions as to size of boiler and draft are such that all the available draft is regularly needed. In most cases, with the stack damper partly closed, the proper regulation can be obtained by varying the positions of the check damper and the ash-pit damper. The fire door should not be used to check the fire except in emergencies, for the reason that the cold air admitted through the open door cools the fire pot at the same time that it checks the fire.

Firing and Cleaning Furnace

Other suggestions that apply regardless of the fuel used are: Attend to the fire regularly, do not wait until it has burned low and heat is needed throughout the house. Often the need can be anticipated and by attention at the proper time trouble can be avoided. In addition, economy of fuel is more likely to be obtained by fairly uniform rates of burning than by attempting to supply a large amount of heat in a short period and then suddenly checking the fire.

Let the size of the coal fired be as nearly uniform as possible. Using coal of uneven size prevents an even flow of air through the fuel bed and increases the tendency of the fire to burn through in spots.

Try to keep the fuel bed free from air holes, as they cause waste of fuel and may prevent the heater from maintaining the desired temperature.

Avoid excessive shaking of the grates and thus reduce the amount of coal lost by falling into the ash pit. Ordinarily, the shaking of the grates should be stopped as soon as bright particles begin to drop through or, under some conditions, as soon as light from the fuel bed begins to show in the ash pit.

When the demand for heat is urgent or the fire must be built up quickly, keep the fuel bed uniformly thick, but not too thick, using the coarser part of the coal and all the draft available. Air will then flow freely through the entire fuel bed and burn the coal at a maximum rate. Under such conditions the firings should be made at frequent intervals and small charges used, so that the fresh fuel will only for a short time chill the temperature of the fire pot. When heavy firings are made the fresh fuel not only increases the resistance to flow of air through the fuel bed, so that the rate of combustion is lowered, but it acts as a cold blanket to screen the heating surfaces from the radiant heat of the fuel bed.

In mild weather it is well to leave on the grates a layer of ashes under the active fuel bed. This layer will increase the resistance to the flow of air through the fuel bed and facilitate the maintenance of the low rate of combustion required in such weather; also, it will cut off some of the grate surface.

Clinkers should be kept worked out of the fuel bed, for they obstruct the flow of air through it, clog the grates, and may break the parts of shaking grates.

Keep heating surfaces, or flues as they are sometimes called if the heater be a boiler, swept clean so that they will readily absorb heat. Soot cuts down the heat-absorbing power of any heating surface very rapidly, and therefore should not be allowed to accumulate. Do not allow ashes to pile up under the grates in the ash pit, for they will seal off the air from part of the grate surface and may cause the grate bars to be burned and warped.

Ash in Different Coals

Purchase coal as free from slate and ash as possible. The inert, or non-combustible, matter not only has to be removed from the ash pit or the fire pot of the heater, but prevents to a certain degree the getting of proper results from the combustible matter burned. In a delivery of coal containing much non-combustible matter the purchaser will usually be able to detect pieces of slate or lumps of bony coal, which contain alternate bands of slate and coal. If the delivery contains an excessive amount of incombustible matter in small particles mixed with the fine coal, the evidence will be the large amount of refuse taken from the heater and the difficulty of maintaining desired temperatures in cold weather. Coals mined in different fields differ widely in the proportion of ash they contain and in the care with which they are prepared for market. Hence it is impossible to say, without a knowledge of the coal, what the proportion of refuse should be. For some typical coals, however, figures are given below to show the proportion of ash and the average and the maximum proportion of refuse to be expected.

Noncombustible matter in anthracite and bituminous coal.

Coal	Average proportion of ash in dry coal.	Refuse	
		Average	Should not exceed—
Pennsylvania anthracite—			
Egg	10	13	15
Stove	12	15	17
Chestnut	14	16	18
Pea	16	18	20
No. 1 and No. 2 buckwheat	18	21	23
Yard pea	15	17	19
Bituminous—			
Eastern	8 to 14	10 to 17	12 to 19
Indiana and Illinois	8 to 16	10 to 19	12 to 21
Southern Kansas	10 to 13	12 to 16	14 to 18

Conclusion

Ascertain by experiment what operating conditions produce the best results in your particular heater and adhere to them. It is impossible to give exact and detailed instructions for firing all heaters. Certain general principles have been pointed out, but the best method of applying these principles in a particular case can be determined only by experiment.

Insufficient draft is often responsible for failures of heating systems to meet requirements. The chimney or smoke pipe may be too small, or may be obstructed, or there may be leaky joints in the pipe.

Firing Anthracite

To get the best results in firing anthracite the following recommendations are made:

Keep the fuel bed thick so that it will not burn through in spots and admit a large excess of air.

If there is a bright bed of coals over the entire grate, as there should be before a heavy charge is fired, some of the burning coal should be pushed to one side or end of the grate—the part nearest the opening where the gases leave the fire pot—and the bed of live coals made thicker there. Then fire the fresh charge so as to make the bed of approximately uniform thickness and yet leave visible a bright spot of live coal to ignite the combustible gases coming off the freshly-fired fuel. In this way combustible gases from the coal will be burned gradually and will not accumulate in the fire pot and burn with an explosion.

If the fire is low, take care not to put it out by throwing on too much fresh fuel. Fire lightly, and allow each firing to become ignited before fresh coal is thrown on.

Relative Advantages of the Different Sizes

Use small sizes of coal if they are available and the draft is strong enough. There may now be less advantage than formerly in burning chestnut size coal instead of stove or egg size because the demand for chestnut has raised the price to practically that of stove or furnace coal. However, in many furnaces a less amount of the small sizes appears to give the same heating effect.

Fuel bills may be reduced by burning pea size, or, better, No. 1 buckwheat, if conditions permit. If the draft is not strong enough, or if the heater is so small that the coal must be burned rapidly, the small sizes may give clinker trouble or may not give heat enough. Under such conditions it may be necessary to burn the larger sizes of coal exclusively, or at least during the most severe weather.

Householders living where the small sizes of anthracite are used for steaming purposes and are generally available can profit most by burning them. In other localities, however, there will usually be a small supply of the fine coal resulting from the breakage of the larger sizes in handling. Some dealers screen out the dust and sell the best of this fine coal under the designation of "yard pea." The price at which it can be obtained will depend, of course, on the demand, but "yard pea" will always cost the householder less than stove, egg, or furnace size. A householder who buys anthracite that has been handled many times may find that the stove or egg size he ordered contains fine coal enough to increase the re-

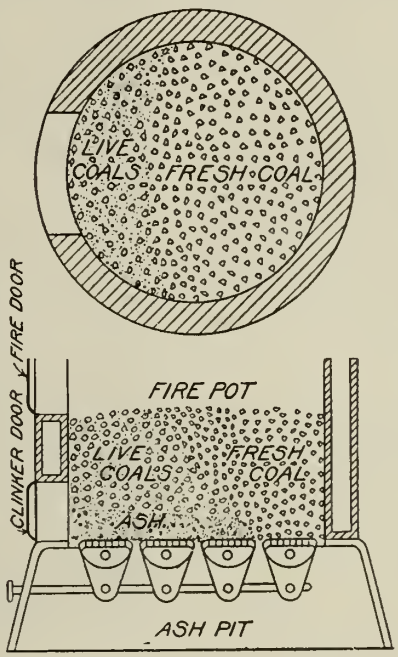
sistance of the fuel bed so much that the coal can not be burned fast enough to heat the house in severe weather. In such a case, it may be advisable to screen the coal with a rake or coal fork and reserve the fine coal for use in mild weather or for banking the fire.

Firing Bituminous Coal

The wide differences among bituminous coals make it impossible to give more than general suggestions for firing them. However, certain points of difference between the methods of firing these coals and anthracite may be pointed out.

Do not spread fresh fuel over the entire surface of the fire. Bituminous coal requires more air immediately after firing than does anthracite coal or coke, and covering the entire fire not only decreases the flow of air through the fuel bed, but also lowers the temperature in the fire pot enough to cause incomplete combustion of the volatile matter distilled from the coal, and consequently, a loss of heat up the chimney.

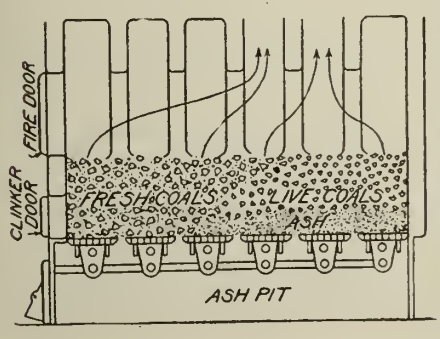
Use some coking method of firing; that is, work the partly burned coal, from which the gas has been driven, to one part of the fire and throw the fresh coal on the remaining portion. The fresh fuel then ignites slowly, the combustible gas is driven off gradually, and the live coals that are exposed on one part of the fire heat this gas and the air coming through the fuel bed so that more of the gas is burned before it leaves the fire pot. If, on the other hand, fresh coal is spread uniformly over the entire surface of the fire, much of the gas driven off is not ignited and escapes unburned. Figure 1 shows how this coking method may be used in firing a heater having a round fire pot, and figure 2 how it may be used for a rectangular fire pot.



Keep the flue surfaces clean and the cleaning doors tightly closed. The cleaning of the flues should be given regular and frequent attention or it is apt to be overlooked entirely.

Banking the Fire

When preparing the fire to last overnight, or for a similar length of time, push some of the burning coal aside and fire the fresh charge so as to leave a bright spot visible to ignite the distilled gases. The drafts should then be allowed to stand open for a short period, possibly half an hour, before they are closed for the night, so that part of the volatile matter or gases in the coal can be driven off before the air supply is greatly reduced. In adjusting the air supply for the night use the ash-pit damper or slide and the check damper in the smoke pipe.



If the ash pit is tight the firing door can and should be kept closed, or part of the heat of the fuel will be wasted in heating the cold air entering above the fire. The quantity of fuel that will be required, and the proper adjustment of the draft will vary, of course, with weather conditions, and will have to be learned by experience.

Firing Coke

Coke can not be burned in the same way as anthracite or as bituminous coal, but with proper handling can generally be used with satisfaction where anthracite can be. In order to have a coke fire last as long and develop as much heat, approximately as many pounds of coke must be fired as of anthracite. The volume of coke, however, will be much greater than that of anthracite, and usually the fire pot will have to be filled completely to hold the fire a considerable period. Coke makes a very porous fuel bed; hence the control of drafts is important. Ordinarily some ashes can be left on the grate and they will make draft control easier.

The proper regulation of draft must be learned by experience in any case, but some general instructions may be given. Before firing a fresh charge be sure that there is a fair bed of fuel remaining from the last firing and that it is thoroughly aglow. If necessary fire a small quantity and let it become well ignited before putting in the main charge. Let drafts stay on for a short time after the new charge is fired, then they may be checked. Coke of uniform size is desirable, and for small fire pots the coke should be about nut size, whereas for larger fire pots coke of stove or egg size may be satisfactorily used.

Firing Wood

Unfortunately most of the equipment for burning wood is poorly developed. The principal difficulty in successfully heating a house with wood is controlling the supply of air to the fire. A wood fire may be kept for a number of hours without attention if the air can be cut off, but the fire will last only a few hours at most unless the air supply is cut off effectively. The fuel bed of a wood fire offers much less resistance to the flow of air than that of a coal fire, so that a very slight difference in air pressure, or "draft," between the furnace room and the fire pot will force through the fuel bed enough air to keep up a good rate of combustion. Even with all draft doors and slides closed, it is difficult to keep a wood fire "banked" unless the coals are covered with ashes.

Owing to lack of space the "Tests and General Deductions" from the foregoing have had to be held over until the next, the October, issue.

Out of the war shortage of tin has come a new and successful substitute for babbitt as a bearing metal. It is composed almost wholly of lead, hardened by an electrical process. Its high manufacturing cost is more than compensated for by the low market price of lead compared with tin. The new metal shows a tensile strength of 13,000 lbs., the figure for genuine babbitt being 11,000; and an elastic limit of 11,525 lbs. as against 10,000 for babbitt. Its friction factor is very low. With a shaft running at 400 r.p.m. and a load of 1,000 lbs. per sq. in., 150° was the highest temperature reached by the bearing.

The Eiffel Tower, the tallest structure in the world, was erected by Alexander Eiffel, a French engineer, for the exposition of 1889 at Paris. It stands in the Champ de Mars, and is 984 feet high (429 feet higher than the Washington Monument). The base is a square of 112 yards, from each corner of which rise the four curving supports of interlaced iron-work. At a height of 590 feet these merge into a single shaft. There are three platforms at various heights, to which the ascent is made by elevators or staircases—1,927 steps in all. The total cost was over $1,000,000, of which the State contributed $300,000. In 1909 the Tower became the property of the City of Paris.

News from Here and There

CONTRIBUTIONS OF NEWS GLADLY ACCEPTED

Trade Notes

The proposal for installing water meters in the city of Lethbridge was defeated at the recent election. According to the Lethbridge "Herald": "The result is not surprising, as the proposal for installing meters, with its expenditure of $35,000, was not placed in that business-like fashion before the electors which such a business proposition demanded."

Contracts have been let for the erection of a comfort station in Moose Jaw, Sask. The contract for plumbing, amounting to $3,493, was awarded to the Moose Jaw Heating and Plumbing Co.

Specifications are to be drawn up and tenders called for immediately for the proposed lavatory on Danforth Ave., Toronto. The building is of brick, a single storey, and has a basement equipped with a boiler-room and coal bin. Six water closets are provided in each end, and twelve urinals have been installed in the western end. Hand basins and drinking fountains will be provided in each section.

General Hughes, after an inspection of Stoney Mountain penitentiary, near Winnipeg, stated that it was the poorest institution of its kind in the Dominion. It lacked modern equipment from the sanitary viewpoint and also from the viewpoint of cells. Work to correct these weaknesses had been commenced before the war, but had been discontinued by the Government during the war because of the large expense incurred. No sanitary conveniences were provided except a bucket, and lamps were used for lighting purposes.

The National Safety Council, with headquarters in Chicago, Ill., are planning a monster program for their eighth annual safety congress, which takes places in Cleveland, O., at the Statler Hotel, from October 1 to 4. This is a congress of men and women interested in accident prevention and the improvement of industrial relations.

Personals

W. H. Cunningham of Kasement Skrene Dore Co., Toronto, who has been spending a few weeks in England and Scotland, on business, returned last week on the Tunisian. Mr. Cunningham reports great difficulty in securing return passage. Many of his fellow passengers have been weeks trying to book.

Dr. M. M. Seymour, commissioner of public health for Saskatchewan, has been unanimously elected an honorary member of the Sanitary Inspectors' Association of Western Canada. Dr. Seymour has taken great interest in the work of the association since its inception and was an invited guest at the recent annual convention in Saskatoon. His work in connection with the promotion of better sanitary conditions in the province is well known and his appointment as an honorary member is a tribute to the members of the association to this.

Theo. J. Lafreniere, sanitary engineer, Montreal, is one of the three members of the commission named by the plan of the governor-in-council at Quebec to serve on the Government housing scheme. Mr. Lafreniere is sanitary engineer of the superior board of health for Quebec province, and professor of sanitary engineering at Ecole Polytechnique, Montreal. He also served as an expert for the International Joint Commission.

ELECTED PRESIDENT CAN. GAS ASSOCIATION

V. S. McIntyre, superintendent of the Light Commission, Kitchener, Ont., was elected president of the Canadian Gas Association, which met in Niagara Falls recently.

The other officers are C. S. Bagg of the Montreal Light and Power Company, vice-president; George Wallar, of the Consumers Gas Co., Toronto, secretary.

The association decided to urge the Dominion Government to look into the matter of having the railway companies use less of the best gas coal in order to conserve the supply of the latter. It is claimed that the coal, while inferior for gas making purposes, is fully as satisfactory for generating steam in locomotives.

Among the matters which featured the meetings was an address by Arthur V White, of the Dominion Commission of Conservation. He spoke on the fuel problem of the future, pointing out that the time would ultimately come when the coal supply on the continent would become exhausted. The use of lignite was one of the means of conservation and alternatives mentioned.

WOLVERINE LTD., NOW IN TORONTO

The Canadian Wolverine Co., Ltd., whose headquartes have been in Chatham, Ont., have been succeeded by Wolverine Ltd., and the place of business of the new company has been moved to 12 Mercer Street, Toronto.

H. G. Waterman as president and E. T. Needham as vice-president and manager, will have direct charge of the interests of the company in its present form. The line handled by the company will be the same as that manufactured under the regular Wolverine interests, and it is stated every effort to take care of the requirements of the trade will be exerted. Mr. Needham recognizes his responsibilities to the trade whom he would serve, and states that they hope by fair dealing and prices to secure a constantly-growing following of regular customers.

SWISS TRADE MISSION TO VISIT MONTREAL

A number of the members of the Swiss mission now in the United States will visit Montreal in the near future, according to information secured this morning through the office of Consul General for Switzerland, Iseli. The Swiss consul is now in New York greeting his fellow countrymen and making arrangements for their coming to Canada. He is expected to return to the city in the next day or so.

This mission, numbering 217 members, arrived in New York early this week. A banquet was tendered them by the state and civic officials of that city. They are visiting this continent for the purpose of arranging for closer trade relations and investigating commercial conditions in this country.

The Canadian Government has issued an invitation to the mission to visit this country, but it is understood that owing to the brief time at their disposal they will be unable to come to Canada in a body. In view of this fact, however, a number of the most prominent members of the mission will come to Canada. They will visit Montreal some time in the month of October, but the exact date, though fixed, has not yet been announced.

The mission is composed of some of the most outstanding business men in Switzerland, economists and professional men. They will investigate American and Canadian life in all its phases and commercial and social conditions. It

is the consensus of opinion that this exchange of ideas and the grafting of the methods of the Western world into the life of a country such as Switzerland will bring about very satisfactory results. The details of the program of entertainment of the members of the mission when they arrive in Montreal have not yet been completed.

MARITIME BOARD OF TRADE TO MEET

To Hold Twenty-first Annual Meeting at Moncton, N.B.

The Maritime Board of Trade will hold its twenty-first annual meeting in Moncton, N.B., on September 17th and 18th. There will be some matters of vital importance to the Maritime Provinces as well as to other sections of Canada that will be brought up for discussion. The sessions will be held in the Moncton City Hall and will open at 9.30 a.m., September 17.

Among the list of subjects to be discussed will be the following:

1. Maritime Union:—By Amherst and Bathurst Boards.

2. Better transportation facilities:—By North Sydney Board.

3. Re-organization of the Military Forces of Canada:—By Charlottetown, P.E.I., Board.

4. Unit system of management of Canadian National Railways, with headquarters for Eastern unit in the Maritime Provinces:—By Moncton Board.

5. Closer relations between employer and employed:—By Amherst Board.

6. Development of national ports on the Atlantic Coast:—By Saint John and Saint Stephen Boards.

7.—Revision of railway freight rates that discriminate against the Lower Provinces:—By Bathurst Board.

8. Development of water powers in the Maritime Provinces:—By Saint Stephen Board.

9. Inquiry as to proportion of work of Geological Survey of Canada in the Maritime Provinces compared with the other provinces of the Dominion:—By Moncton Board.

10. Transportation—(a) Standardization throughout, of the P.E.I. division of the Canadian National Railways at the earliest possible moment, (b) The securing of a car ferry steamer to supplement the present car ferry between Borden and Tormentine; (c) The placing of S.S. Northumberland, now idle in Charlottetown, on the Charlottetown-Pictou route; (d) Improvement of the passenger service between P.E.I. and mainland points:—By Charlottetown Board.

11. The advantage of a uniform system of weights, measures and money:—By Saint John, N.B., Board.

12. War memorials:—By Saint Stephen Board.

13. The decreasing representation of the Maritime Provinces in the Dominion House of Commons:—By Moncton, N.B., Board.

City of Chatham Considering Water Supply and Sewage Disposal Question

INVESTIGATION of the water supply and the question of sewage disposal is engaging the attention of the Water Commissioners of Chatham, Ont. The question of using the Sny River as the source of Chatham's municipal water, according to Chairman Harry Westman of the Water Commissioners, looks very much as though the scheme would be feasible.

It is impossible to state anything definite, he says, but the commissioners are very hopeful of presenting a proposition to the ratepayers which will convince them that it would be advisable to get water from the Sny.

"There is a very important feature to the proposition," stated Mr. Westman, "which has not been given much publicity, and which to my mind is a very great argument in favor of using Sny water, providing it will not cost to much to pipe it to Chatham.

For some time the health authorities have been after Chatham to construct a sewage disposal plant. They believe that it is not a proper thing to have the sewage dumped into the river, when the city's supply of water is secured from the Thames.

"This matter has been up several times, and those who have been studying city's problems are firmly of the opinion that it will only be a few short years before Chatham will be compelled to erect a sewage disposal plant at a cost of about a quarter of a million dollars. If the civic water supply is secured from the Sny, however, it will not be necessary to think of sewage disposal. This will mean a big saving of money for the city.

"This to my mind is one of the strongest reasons why we should get water from the Sny if anything like an attractive propostion can be figured out. This is the reason why we have instructed engineers to drop everything else for the time being and work on the Sny scheme. Until we know what it will cost we are not in a position to say anything definite. I have a very strong opinion, however, as a result of my own investigations, that the Sny scheme will be found to be the cheapest and best in the long run.

ASKING $50,000 DAMAGES

MacKay and Mahon of Woodstock, have issued a writ on behalf of Harley Barton, school teacher, against the Ingersoll Gas Company for the sum of $50,000 to cover injuries and disfigurements received by Barton through the alleged carelessness of the company. Barton was spending his holidays near his home in Ingersoll, in January, 1918, and while visiting the Ingersoll Gas Works, an explosion took place, killing the superintendent and severely injuring the plaintiff.

EXCHANGE NO FACTOR IN BASIS OF TARIFF

Ottawa.—The Customs Department has had many requests from importers that, in view of the fact that the British pound sterling has heavily declined, this should be taken into consideration when Canadian importers pay customs duties on imports from Great Britain. The practice is that they pay on the par value of $4.86. They believe that they should be given the benefit of current exchange.

The Customs Department points out that the practice is fixed. The matter of exchange is not taken into consideration as the value of the pound sterling is fixed by the Currency Act of Canada as compared with the dollar. Officials claim there is no injustice to the importer, as the goods he imports are worth at the rate of $4.86 2-3 in Great Britain, and under the customs law goods are valued at the time and place whence they are shipped direct to Canada. The importer gets sufficient advantage in the favorable rate of exchange.

The matter has been up for consideration several times. The practice is the same in the United States, the valuation for customs purposes there being $4.86 2-3, as here. The department has refused to entertain all requests to accept payment at the exchange rate.—T. M. F.

CATALOGUES and BOOKLETS

HOYT METAL CO.

A very interesting booklet has been issued by the Hoyt Metal Co., Toronto, covering one of their products. This is attractively gotten up, printed in two colors on coated stock and is pocket size, which makes booklet convenient to carry A full description of the product, its uses and the results of tests in actual use are given.

NEW COUNTER SIGN

The Wilt Twist Drill Company of Canada, Limited, Walkerville, Ont., have issued a very attractive counter sign. This sign, which is intended for distribution to the trade, can be used either as an easel or hung on the wall. Those who are selling Wilt products will find this a very attractive means of keeping the Wilt name before the buying public.

Heating and Ventilating

THE HEATING OF THEATRES

Twelfth Article of Series Prepared for Readers of "Sanitary Engineer" by N. A. Kearns

Editor's Note.—This article is the twelfth of a series prepared especially for the readers of SANITARY ENGINEER, covering heating and engineering practice reduced to its simplest terms. Readers will find this article on "The Heating of Theatres" a most illuminative one. The first article of the series appeared in the April 1 issue. Descriptions of installations made in different classes of buildings will be given, together with the method used in making the design for these installations. It is not our purpose to give complicated formulas, but rather to present the simple rules that have been based on these formulas, in such a way that the reader will be enabled to design a heating and ventilating system without having to refer to the data given in engineers' hand-books. The author of these articles, Mr. N. A. Kearns, has designed heating and ventilating equipment for all classes of buildings in practically every province of the Dominion. Some of the buildings were such that the heating and ventilating equipment had to be installed under the most adverse conditions, whereas in other buildings the design for the heating and ventilating equipment was incorporated in the constructional drawings. The thirteenth article of the series will appear in the next issue.

THE problem of successfully heating a theatre is a direct problem of ventilation, and when an engineer attempts to design or instal a system of heating, without paying some attention to the requirements of ventilation, he is but inviting failure as a reward for his misguided efforts.

The proofs coming for experience is that no large assembly hall can be properly heated unless there is a constant movement of air throughout the entire volume of the room; and that the heating effect of the circulation of air is, beyond the shadow of a doubt, superior in every way to that where direct radiating surfaces are used alone. Now, this being the case, it is only reasonable that the engineer should look into every contributing cause of advantage, or disadvantage, in using particular types of ventilating apparatus for the installation projected.

Before the engineer can decide on the system that should be used, he must ascertain the class of entertainment for which the building is intended; whether it is to be used only as an auditorium for concert purposes, or as a picture play house, a vaudeville theatre or one where the drama is presented at intervals. This is necessary because each of these buildings have requirements peculiar to its type. For instance, the ventilating of a moving picture house is of an importance that takes precedence to the heating. The reason for this will be given further on in this article. On the other hand, the requirements of the concert hall and legitimate theatre are such that, whilst the installation of the ventilating system is an important item, the provision of a very flexible system of heating is necessary on account of the varying circumstances common in a building that is only used at intervals. This will also be dealt with further on in this article.

First, we will take up the problems especially belonging to the systems for moving picture houses; and before going very far into this we must make a survey of the class of buildings used for this purpose.

Moving picture houses range from the transformed store, where a few hundred dollars represent the investment, to the sumptuous auditoriums that have cost nearly half a million dollars to erect; but the problem of heating is of the same kind for every stage of development, and differs only in a degree for difficulty of solution.

Those who seek entertainment in the transformed store theatre require that they be supplied with pure air just as much as those who go to the larger and more expensive palaces. They require just as comfortable a temperature as if they were sitting in a building where the grand pipe organ adds interest to the screen. Fortunately the transformed store is usually of such a limited seating capacity that systems of heating and ventilating for such may be obtained at a comparatively low price, so that there is hardly an excuse, in the plea of poverty, for the omission of an adequate heating and ventilating plant from this kind of a building, however small it may be.

The transformed store is generally a rectangular room, with the box office and entry crossing the entire front. There is usually an intercepting wall placed at the rear of the entry so that a direct draft traveling through the opened doors and down the aisle will not cause discomfort to the patron who might be in the path of this current of air. In some buildings of this class the greater proportion of the radiation required for the heating of the building is set in the passage between the intercepting wall and the entries. The excess heat developed at this location is carried in the air that is drawn through the theatre by the suction of an exhaust fan at the end of the room farthest from the entry. There have been cases where the radiation installed in the usual way, along the side walls, has not been sufficient to heat the building and when afterwards the same area of surfaces were placed in the entry, as described, no further complaints were registered regarding lack of heat. However, a system of heating and ventilation of this make-shift arrangement is likely to be subject to noticeable drafts. Mention has been made of it here only to illustrate how the effectiveness of seemingly insufficient radiating surfaces may be increased by the provision of a fan, even when there must be added to the usual heat loss the loss that comes from the higher standard of ventilation obtained by the use of the fan.

Moving picture showhouses are, as a rule, occupied by spectators from the early part of the afternoon until well on to midnight, and the heating effect of the occupants of such a building is often great enough to raise the temperature of the building away beyond the point of comfort. Therefore, it would seem that the provision of an exhaust fan is of greater importance than that of a heating system, or of the installation of any air warming apparatus. Now, if the building were filled with spectators

through every hour of the day and night, we might get along very well—at least in the climate of Toronto—with no heating system at all; but when we pause to consider that the people coming into the theatre during the opening hours are not enough in numbers to appreciably affect the temperature of the building, we understand why we must provide a system that will heat the building in the absence of a filled house. Then there is another thing to consider, and that is the matter of providing air to take the place of the air exhausted from the building by way of the ventilating system. If we allow air to enter the room through accidental leakage, we may find that an open door or window is allowing more air to come in at one location than may be desirable. The people sitting close to that opening will find out before very long that the building is ventilated in a way that does not seem to be quite right. So we must provide enough openings to allow fresh air to enter the building without causing drafts. It will not do to have that air entering at a temperature out of proportion to the temperature requirements of the room; the incoming air must be conditioned by the raising of its temperature in the cold weather and by the cooling of its temperature during the summer.

The greatest problem of the ventilating of the moving picture house is that of keeping it cool enough during the summer when the seats are filled. This difficulty may be overcome by the installation of an air cooling system, and when so met, the cold fresh air, in our opinion, must not be driven into the auditorium under the seats. There is a reason for this that should be obvious to those who have even a slight knowledge of physiology. Of course, this only applies to conditions where the air is driven in at a temperature of from fifteen to twenty degrees lower than the surrounding atmosphere. In such a case it would be well where the "mushroom system" is used to make arrangements for the exhaust of air through these heads, and to provide some other way of admitting the air to the room. The mushroom system of air distribution is of so much value in providing an equable distribution of air that ordinarily, where it is used, with an adequate fresh dry air supply, and powerful exhausts in the ceiling, the installation of a cooling system is not required.

From what we have already written, it should be evident to the reader that upward extraction of foul air is desirable in moving picture theatres where no air cooling apparatus is installed; and a downward system of foul air extraction where air cooling apparatus is a part of the equipment.

The intervals of time when a moving picture theatre is unoccupied by spectators are, as a rule, so short in their duration that it is not advisable to allow the building to be without heat at these times. The best way to provide heat for such a circumstance is by means of direct radiators, set where most convenient and effective. When the building is occupied these radiators, unless fitted with thermostatic regulating valves, should be fed from a main, fitted with a valve that may be used for cutting off the heat supply of these radiators when the building is filled with spectators.

It will also be necessary to provide direct radiators for all offices, cloak rooms, passages, and such other rooms as lavatories, etc. There should be a generous supply of radiating surfaces at the entrances; in fact, many small theatres, as we have already stated, are almost entirely heated by the radiators set in these very exposed locations.

Care must be used in seeing that every cloak room is provided with an individual exhaust fan of a suitable size, or that its vent is connected to the main exhaust fan in a manner that will assure the proper ventilation of these rooms at all times. This note seems to be quite necessary in view of the fact that scores of theatres are notorious for their stuffy dressing rooms. The ventilating system of the lavatories should not be connected in any way with that of the balance of building; and each should have their individual exhaust fan.

The machine booth should have a separate exhaust fan, that may be turned on or off at will of the operator of the machine. There should also be a fresh air inlet for this room connecting to the outer air; otherwise the suction of the exhaust fan may cause enough air to enter the booth by way of the opening in front of the machine to fog the lens of the projector.

There is one other part of the building that must be ventilated, and that is the loft between the ceiling and the roof. This space must not be ventilated by any part of the system for ventilating the auditorium. The openings that are in the ceiling of the auditorium must be connected to the exhaust fan by independent ducts and under no circumstance must air from the auditorium be allowed to escape into the loft. The reason for this is that the air in the auditorium is heavily charged with moisture and when it comes in contact with the cold roof this moisture condenses and drops down on the ceiling below, where it may loosen the plaster. The loft should be ventilated by the provision of air inlets just above the ceiling joists and air exhausts placed at intervals in the roof. These will not only prevent moisture gathering on the underside of the roof during the winter, but will also assist in keeping the building cool in the summer.

The detail of providing ventilation for the roof space is one that the heating engineer might think should be included in the duties of the architect. It might be so, but, nevertheless, the heating engineer should look to it that this detail is to be attended to by someone, because there is the possibility of the architect neglecting it.

The subject of fresh air intakes from out of doors has already been covered in some of the articles on school ventilating systems appearing in the SANITARY ENGINEER, so we will not go over this ground again, other than to repeat that the intake should be set high enough above the grade line to escape the danger of allowing dust from the roadway to enter the fan room. The intake should be set remote from smoke stocks, etc., and it should be provided with a heavy wire screen and throttling dampers.

Where there is danger of dust entering the intake an air washer should be provided. Large cheesecloth screens are, at times, substituted for the air washer. They are made in this way: Cheesecloth is stretched on small sash backed with chicken netting, to prevent bagging of the cloth, and the sash are set in a rabeted frame. Sufficient area must be provided to allow air to pass through the screens at a velocity of not more than one hundred feet a minute. The writer has not found these screens satisfactory because of the difficulty in having them properly cleaned, at the intervals required, by the person operating the ventilating system.

We will now turn to a consideration of systems for public assembly halls other than the moving picture house.

Our example will be a play-house that caters to the lovers of the spoken drama, and where the house is occupied by an audience for only about four hours of the day. Now, no one likes to see coal wasted in keeping a building warm when no one is enjoying the heat. If we should instal direct radiation in such an auditorium and allow our building to grow cold during the day, we might find that we could not get it warm again in time for the evening's entertainment. Some men will insist that no coal is saved by allowing a building to get cold during the winter, and that the heat should be kept on all of the time. Perhaps they are right, but there is no question but that the man buying the coal thinks always that they are wrong. So here is the problem: To provide a heating system that will respond to the sudden demand for heat, and that will also provide a flexibility of control that permits a properly graduated lowering of the temperature when the building becomes too warm as the evening advances. We believe that this problem is best answered in the installation of a properly designed and operated forced blast heating and ventilating system. What is a blast system? The name might lead one into the thinking that it was a system where the air came in at a blast similar to that of a typhoon or of a blizzard. But this is not so. The fresh air from a properly designed blast system enters the room so slowly and escapes, when visited, so silently after properly performing its duties that the

Continued on page 35

Ventilating the Modern School

Eleventh Article of Series Written Especially for "Sanitary Engineer" by N. A. Kearns—First Article of Series Appeared in April 1 Issue

BEFORE a man long practises a trade, a business, or a profession, he will find that a lack of business sense will prevent his advancement much more than any lack of knowledge regarding the details of the commodities which he sells. Lacking knowledge of the details his business sense will prompt him to study details, but lacking business sense his knowledge of details will not prompt him to study business.

It is the purpose of this article to draw the reader's attention to the necessity of carefully examining the plans and specifications that may be presented to him when a School Board asks for tenders for the heating and ventilating system for one of their buildings. He should carefully examine the specifications to see how the guarantee clause reads, so that he will not be called upon to stand the brunt of the error of someone else.

These guarantee clauses are put in specifications assumedly for the purpose of protecting the School Board from the actions of incompetent or dishonest persons. We say assumedly for the reason that the phrasing of many of these guarantees is often that the men responsible for the designs wish to throw the responsibility on to the shoulders of the fitter.

There are a great many men in the world who consider it the finest kind of business to get service for nothing from some source and sell it at a higher figure to someone else. These men are often employed as experts in the rendering of advice to School Boards, and, frequently, they are kept so busy in running after work of that kind that little of their time can be spent in study. "Huh!" they grunt, "what's the use of studying? You can buy brains." Because they never study they are not in a position to value the merits of any professional man's advice; so they look around for advice where they think it may be got for nothing. "Now," they say, "we don't want nothing in them specifications that's agonto cause us trouble, so you had better put in the guarantee clause, making the steamfitter do the work according to our directions, but on his own responsibility." If such a man had to guarantee the efficiency of the plant himself he would soon be out of business. The Province of Ontario has its fair share of these men. They do not even understand the terms of the heating specifications, but, nevertheless, get paid by many School Boards for the service rendered by an engineer employed by the company whose goods are mentioned in a "closed" specification.

The engineers employed by such firms are, as a rule, quite competent, but their hands are tied by the condition of making the specification fit one class of materials only. Personally, I believe that the employment of such engineering service is quite justified when the men supplying that service assume the direct responsibility of the guarantee, and whose representatives inspect the work without the interference of, and the payment to some third person whose only qualification for the work is a list of schools where he was paid for the same ornamental appearance.

When specialty systems are desired by the owners of a building, the men supplying these specialties should be the men making a guarantee for their efficiency. But it does not seem fair that these men should also be called upon to guarantee the boiler unless they specify it. The piping system should be guaranteed by the man who designs it. When the fitter gets a guarantee from the people supplying the boiler, that the boiler will do all the work that is specified for it, and a guarantee from every manufacturer of the materials specified; and a guarantee from the engineer who is responsible for his design, he may then, and not until then, with safety assume the responsibility of the general guarantee.

When getting a guarantee from any firm that is not well established or that is not willing to furnish a bond to back up their guarantees, it is well to look for "jokers" in their wordy epistles.

Some of the catch phrases in such a so-called guarantee would never allow their maker to escape censure in a court of law, but the presence of such phrases in a guarantee makes their writer, in his ignorant confidence, believe that he is safe in any lying promise that he may deem convenient.

Guarantees are often called for by men who are not quite satisfied that the system they specify will do the work demanded, and when some shrewd fitter suggests that it is impossible to guarantee the work as laid out, these men allow the fitter to substitute other work or materials than that on which the tenders for the work were based.

One time an architect employed a man who had spent a number of years in a heating contractor's office. This young fellow had spent his time with the tools and was a qualified mechanic, as well as being a degree man of a technical school. Specifications were drawn up for the heating of an office building, and the guarantee clause read something like this: "The contractor is to check over the plans and specifications, and before commencing work is to notify the architect of any discrepancy that may appear. He is to guarantee that his work and material will be of the quality specified, and under no consideration is he to do work differing from that shown or specified without consulting the architect and securing his written consent for such changes." The owner of the building did not employ the architect to inspect the work, but decided to attempt this himself. The contract for the installation of a steam heating system was let to two careful and conscientious men, who, not being blessed with much capital, had recently acquired a partner with a few thousand dollars and no sense. This lippy individual ran over the specifications and noticed the side heading of the guarantee clause. Immediately he jumped to the conclusion that the fitter was called upon to guarantee the work, so, without consulting anyone, made just such changes as he believed would save a few dollars. When the time came for the receipt of final payment, the owner of the building refused to accept the plant without a guarantee covering its efficiency. On going through the original specifications the heating contractors discovered that they were not required by the terms of that contract document to provide such a guarantee. They were advised that if they had followed the plans they could not be compelled to give a guarantee regarding the plant's efficiency, but, as they had taken the responsibility of deviating from the plans they could not expect to receive final payment from the owner of the building until they furnished the guarantee.

In another case a contractor from a large city undertook the work of installing a heating plant in a country school. The plant specified was guaranteed by the manufacturers of the specialties specified and the agreement between the board and the manufacturers was to supply the inspection necessary for the proper installation of their system of heating. The manufacturers neglected to send a competent man to inspect the work during the time of installation. When the work was practically complete the engineer responsible for the design paid a belated visit to the premises and then discovered that the foreman steamfitter, with wonderous zeal and egotism, had decided that it was part of his duties to revise the manufacturer's plans. This is another case of where misplaced zeal took dollars out of the profits—dollars that had to be spent in changing the work before the manufacturers would give the School Board a guarantee.

Perhaps, in both of the cases mentioned, the men who were responsible for making the changes were quite competent to lay out and to do the work, but they certainly possessed little business sense or they might have understood the difficulties they were inviting.

When heating and ventilating plants are designed by competent men, there is not, as often now as in the past, a clause in the specification demanding that the contractor guarantee more than work or material. When a board employs an inspector to pass on the work and material as it is being installed, and furn-

ishes the contractor with specifications that describe methods of doing the work, the contractor should not be asked to furnish a guarantee for the efficiency of the plant. Only when the contractor is responsible for the plans and specifications should he be called upon to make a guarantee. If the board employs an architect or a consulting engineer to lay out the heating system, it should secure a guarantee from the persons responsible for the design and not expect the contractor to check the figures of a man whose fees are generally as great as the net profits of the contractor.

Before entering into the contract to instal any kind of a heating or ventilating system, the contractor should come to a thorough understanding with the School Board regarding guarantee and payments, as otherwise a good deal of misunderstanding is sure to occur before a final settlement is made.

THE HEATING OF THEATRES

Continued from page 33

occupants of the room take no thought of the temperature of the building either when they enter to see the play or when they are leaving.

With a blast system the walls of the auditorium may be still cold from the effect of a prolonged absence of heat, but the atmosphere of the room, and the furniture contained therein will be warmed from the heat carried in by the air, so that no one in the room will have grounds for complaint, unless they wish to warm their cheeks on the walls.

In designing a blast system for a theatre building, we must first figure on the heat loss in the usual way and provide enough heating surfaces in the air warming radiators to offset this. Before the building is occupied there need be no exhaust of air from the auditorium and therefore there will be no demand made for an outdoor air supply. So all the air extracting ducts must be so arranged that the air within the auditorium can be returned to the air warming rads in the basement, and there reheated. For the purpose of heating the building the temperature of the air will range from 85 to 120 degrees above zero, depending on the weather and the speed of heating service required. After the building is occupied the damper should be thrown back from the outdoor air supply duct, and the vent to outdoors should be opened. The air then entering the auditorium will, of course, drop some in temperature, but in any case it should not be allowed to exceed a temperature of 80 degrees above zero while the building is occupied. If the proper amount of air for ventilation is supplied it is not likely to require a higher temperature than 65 to 75 degrees above zero. Automatic heat regulation must be supplied with a system of this kind.

The air washer should not be used during the time that the temperature of the auditorium is below 58 degrees above zero.

Direct radiation should be placed in the entry, in the dressing rooms, the offices, etc.

The stage of the ordinary theatre requires a great deal more radiating surfaces than can be calculated by any rule. So after figuring the heat loss due to the great wall area at the rear of the stage, and after placing enough radiation, high up on that wall and in the fly galleries, to protect the baldheaded men in the front row from catching cold, there should be an equal amount of direct radiation placed down close to the stage floors. The stage of a theatre is a very draughty place, and as the dressing rooms are usually so small that they are too warm, it is necessary to fairly load the stage with heating surfaces to prevent the actors from becoming "chilled to their bones."

If direct radiation is relied upon alone to heat any auditorium, be it church or theatre, and if that auditorium is to be heated only at intervals, we must provide at least 30 per cent. more radiating surface than might be ordinarily used. The boiler and the rest of the system must be in a like proportion.

In auditoriums of this class a boiler should be provided that will permit the getting up of considerable steam pressure quickly by hard firing, and it must contain a sufficient body of water to allow for a great deal of sudden evaporation without much lowering of the water line.

It is impossible to ventilate a theatre building by a gravity system. Some theatres are ventilated by the use of an exhaust fan only, whilst others are ventilated only by a pressure fan. Usually it is well to instal both types of fans and run them in combination. If this, for any reason, is impossible, and only one type of fan can be used, the fan selected for a moving picture house should be of the exhaust type; for all other auditoriums the pressure fan should be specified.

In any case the fan specified should have a capacity equivalent to 1,800 cubic feet of air per person per hour. When a pressure fan is used for supplying tempered air, and exhaust fans are used in the extraction of the foul air, these fans must not be so small that they must be run at an excessive speed in performing their functions; nor must they be so large that they must be run so slow that proper conditions of pressure can not be obtained. The danger of getting a fan too large for properly balanced pressure conditions is greater where there is a long run of air-carrying ducts in front of the fan nozzle, than when the fan is blowing air through a short system of these ducts. This is why the fans specified for foul air extractors are figured for a lower static pressure than those used as pressure fans. Generally in theatres seating about 1,200 persons, the supply fan is proportioned for a static pressure of from .75 to 1.0 water gauge with an outlet velocity ranging from 1,800 to 2,000 feet per minute. Exhaust fans are, as a rule, in this class of work proportioned for a static pressure of .37 inches water gauge and an outlet velocity of 1,800 feet per minute. These proportions are based on the assumption of the use of fan with blast wheels of the multi-blade type. When a propeller type of fan is used in the foul air exhaust the proportion should be based on static pressure of .25 inches water gauge and a speed not exceeding 550 revolutions per minute.

In this general description of the heating and ventilating systems of theatres we have directed the reader's attention more to some of the requirements of fans than we have to certain other details that are as essential to a perfect working system. Frequently there is a good deal of misunderstanding in the matter of fans, because some men cannot clear their heads of the idea that volume of air is the same thing as a pressure; they believe that if they require a fan delivering 30,000 cubic feet of air per minute, all they need do is to specify a fan having that capacity, and, with the same incomplete understanding, believe that the fan should be run at a speed not much exceeding that of 175 revolutions per minute. It is quite correct that fans should be run at as low a speed as may be possible under the circumstances surrounding their installation, but the fact must never be lost sight of that the fans must be run fast enough to develop the pressure necessary to properly fill the entire system of ducts, etc., with air, traveling the directions required by the design.

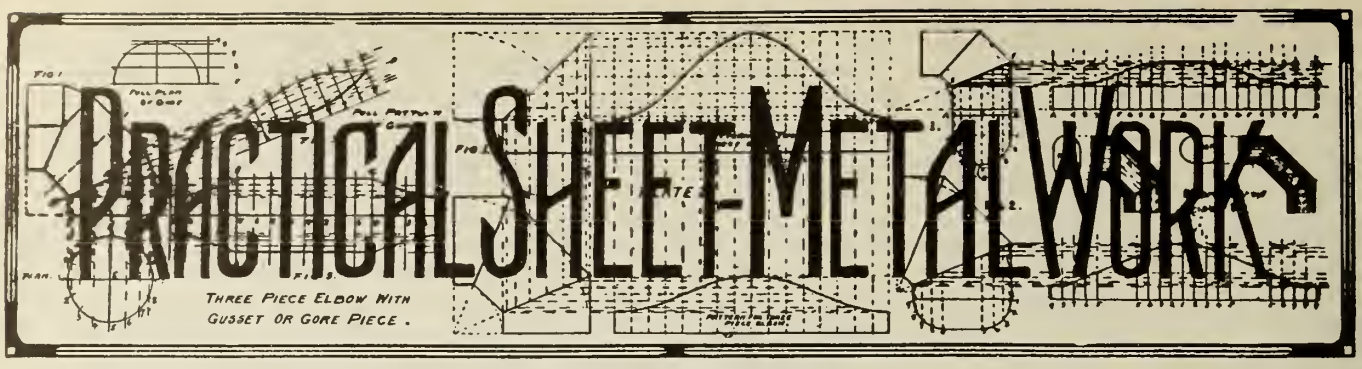
A PECULIAR ACCIDENT

A peculiar accident happened at Parry Sound, Ont., when a small water heater, which had been repaired at the shop of Messrs. Elliott & Guilliat, was being tested for a leak by attaching to the water tap, an explosion occurred. A large piece of the steel sheeting on the heater flew across the room, hitting Mr. Elliott on the arm, cutting it badly, and breaking the arm.

Mr. Guilliatt was examing the heater a few seconds before and had just left it a moment before the accident occurred. The supposition is that, at the time, direct pressure was being put on the mains, causing many pounds additional to come through. The piece which hit Mr. Elliott was about a foot long and six inches wide, and of about an eighth of an inch in thickness.

SEWER RENTAL RAISED

An amendment to the plumbing and drainage bylaw has been passed by the council at Kamloops, B. C., raising the sewer rent to $2.50 per annum. The new bylaw states that all moneys obtained be placed in a separate fund, known as the sewer rental fund, to be used for the maintenance and extension of the sewerage system as the council may see fit.



By THOMAS STANFIELD

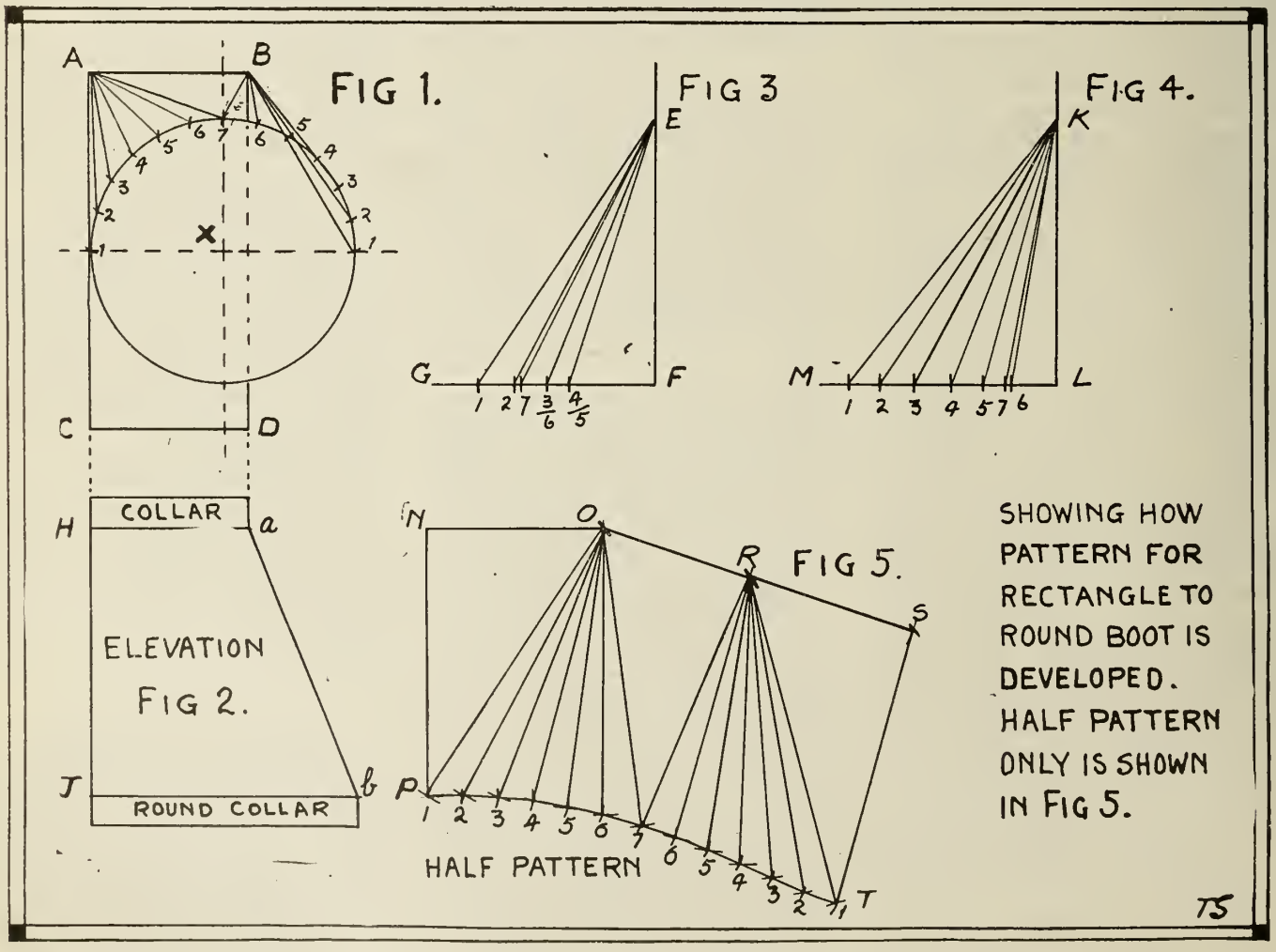
A READER asks how a rectangle to round boot pattern must be developed. Sizes given are: 24 inches high, 24 inches diameter, with rectangle 32 inches by 14.

The first step to take is to draw a plan and side elevation as shown in Figs. 1 and 2, and divide the circle into four parts. Then divide two of these parts into six equal parts each as described by 1, 2, 3, 4, 5, 6 and 7. It will be seen that the rectangle is marked A B C D. From point A draw a number of lines to 2 3 4 5 6 and 7, and from B to 1 2 3 4 5 6 7. It will be seen that points B, 4 and 3 are in direct line with each other, so that the one line will suffice.

Now turn to Fig. 3 and draw a vertical line E F with line G at right angles. Next mark off the height of boot as shown in Fig. 2 at H J on vertical line and the distance will be given between points F and E. Turn again to Fig. 1 and place compass point at B, and open to point 1. Transfer this measurement to line F G in Fig. 3 by drawing an arc as shown at G 1. Again place compass at B in Fig. 1 and open to B 2, transfer this measurement to Fig. 3 on line F G and repeat until all the measurements have been used from B.

Now turn to Fig. 4 and draw lines K L M, repeating in the same order all the previous operations by placing compass at point A and opening same to 1 2 3 4 5 6 7 in turn and transferring each measurement until Fig. 4 is completed. All the details have now been procured that are necessary to commence with the developing of the actual pattern.

First draw a horizontal line as at N O with line N P at right angles to same. Let the distance between points N and O be equal to half the length of the rectangle, which in this case would be 16 inches. The length of the vertical line N P should be 24 inches, being the length corresponding with the height of the boot. See H J in Fig. 1. Turn again to Fig. 3 and draw a number of slant lines from E to 1 2 3, etc., until all the points are formed at E. It will be seen that lines 3 and 4 are the same as 6 and 5. Now, place the compass point at E and open up to 1,



transferring same to Fig. 5 by placing point at O, and drawing a small arc. Next, place the compass point at P and make an arc cutting the one just made, procuring the measurement for this short arc from any of the small measurements shown in half circle at Fig. 1, 1, 2, or 2, 3. It will be seen that by repeating these operations all the measurements described in Fig. 3 to Fig. 5, at the stretchout line will be procured. Now connect all these points from P 1 to 7, with point O.

We will now turn to Fig. 1 and place compass point at A, opening same up to B. Then transferring this measurement by placing compass point at O in Fig. 5 and drawing a small arc as at R.

It is now necessary to turn to Fig. 4 and connect point K with 1, 2, 3, etc., by drawing the slant lines shown, and repeating the operations by transferring all the measurements as has been done from Fig. 3 except that the measurements must be transferred in the order shown following from 7 to 6, 5, 4, etc.

Having cut all the arcs again, connect points 7, 6, 5, 4, 3, 2, 1 to R; next, draw an arc from R to S, the distance being the same as from N to O. To determine the distance between S and T 1, place the compass at A and open to B in Fig. 2, this being the true length of the metal at the slant height of the boot. It will be seen that the distance between O R, Fig. 5, is equal to H, a, Fig. 2, and that R S and N O equals the half of front and back of rectangle portion shown at A C and B D in Fig. 1. The curved line P T in Fig. 5 equals the true length of half the round end.

By turning the half pattern over at N P and allowing for seam at S T the seam will come at front of boot.

CENTRAL STATION HEATING IN DETROIT

Continued from page 24

heated is returned to the plants only to a very limited extent. In the tunnels it is necessary to install a return line to receive the discharge from the traps on the steam lines, and wherever possible the condensation is drained from the adjacent buildings to this line. It is difficult and costly, however, in many cases, to arrange a gravity discharge from the building basements to the tunnel, and the cost of installing and operating pumps to handle the condensation would more than offset the value of the heat and the feedwater which would be salvaged.

In the districts not served from tunnels, all of the condensation is wasted to the sewers. Even with the present high cost of coal, return lines would scarcely be a profitable investment. Furthermore, they are short-lived, and any leakage from them is disastrous to adjacent steam lines. The proper method of salvaging the heat in the condensation is by means of an economizing coil in the consumer's building.

Consumer's Installations

The consumer's equipment includes, besides the usual radiators and piping, a pressure-reducing valve, which reduces the service pressure to the lower pressure required for heating, and a trap whose function is to discharge the water of condensation from the system.

Economizing coils, utilizing the heat in the condensation, are recommended by the company, but not required. They are seldom installed in any but the largest buildings, as few consumers care to make the necessary investment even though a demonstrated saving can be made. In some buildings the condensation is passed through a surface heater which preheats the water used for lavatory purposes, and this seems to be the most satisfactory form of economizer for large buildings.

The regular heating season covers 8 months of the year, though summer service for cooking and water heating is supplied to a few consumers conveniently located. Cool weather in September usually makes necessary the commencement of service before the contract date of October 1. It has, in fact, been started in August. Steam was originally sold to some extent for power purposes, but this service is now practically discontinued.

Meters

The meter first used in Detroit was of the tilting type, consisting of a rectangular pan of two compartments hung on knife-edge or ball bearings, the compartments filling alternately and, when full, tipping the pan so as to bring the opposite compartment to the filling position. In 1907 a revolving meter was devised, consisting of a drum of four compartments which filled and dumped successively, the drum being revolved by the weight of the water. This meter was fairly successful and a few of that design are still in use, but a greatly improved design of revolving meter, operating on the same general principle (Fig. 5), was originated in 1909 by Hans Resert and is being used at present, with slight modifications.

MARKET TENDENCIES

Continued from page 40

16 gauge	4 85	5 20
18-20 gauge	5 70	....
22-24 gauge	5 75	....
26 gauge	5 80	....
28 gauge	5 90	....
3-16 inch plate	4 75	6 25
¼-inch boiler plate	4 25	5 80

Prices shown are for full cases. An extra charge of from 25c per 100 lbs. is made for less than case lots.

GALVANIZED SHEETS.

10¾ oz.	$7 80	$8 00	$8 10
U.S. 28	7 40	7 60	7 70
U.S. 26	7 10	7 30	7 40
22 and 24	6 95	7 15	7 25
18 and 20	6 80	7 00	7 10
16	6 65	6 85	6 95
12 and 14	6 50	6 70	6 80

An extra is now charged on galvanized sheets, 10¾ oz. and 28 ga., when shipped out in sheets 3 feet wide. The extra charged over prices shown above is 20c per 100 pounds. Other gauges show no change for different widths.

Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

Steady Trade in Lead Products at Firm Prices

LEAD AND ZINC PRODUCTS.—Manufacturers report business coming along nicely with a decidedly firm undertone to the market on solder, due to advances recorded in the price of tin. No changes have yet occurred, however. Lead products are holding unchanged with a good demand in evidence.

Scrap Markets Still Rather Quiet

OLD MATERIALS.—Business is fairly good in the scrap metal market, and this is about all that can be said for it. The larger dealers are shipping to the United States market, but only on contract, and no new business is being taken on for the present. In some places slight increases have been shown in line with tendencies outlined in these columns last issue.

Copper continues to be fairly strong. There is quite an amount of copper turnings yet in this country, the property of the United States Ordnance Department. A certain part of this has been disposed of, but sales have not been made against the entire holdings. As far as the shell steel scrap is concerned, the market has been cleared out, as all that the United States Government had stored here has been sold or removed, while that of the British Government has in a large measure been shipped back to Britain.

Tin Registers an Advance; Others Holding

INGOT METALS.—Higher prices are again the order of the day in some quarters on tin, with other metals showing an unchanged market, though spelter is weak. The demand for all lines is generally good.

COPPER.—There has been just a little doubt as to the course of copper during the past few days, it being held that it was at its peak and was likely to recede. The trade here is not disturbed, this being quoted at 27c per pound with a somewhat steadier feeling apparent.

TIN.—An upward move is again revealed in some quarters on tin, prices showing a wide range as a result at 62c to 65c per pound. Supplies are ample and the demand considered satisfactory.

SPELTER.—Weakness is showing up in this metal, but no actual change in price is shown here, 10c per pound being the figure generally prevailing.

LEAD.—The demand for lead is considered very good and the market is ruling firm at unchanged levels. Some factors have made a slight advance in quotations, but this has not extended to the local field.

ANTIMONY.—A brisk demand is reported which serves to keep the market firm. Supplies, though ample, are not superfluous. The price ranges from 10c to 11c per pound.

ALUMINUM.—New features are lacking in regard to this metal. Sales are coming along pretty fair and price shows no change at 35c per pound.

Market Conditions and Tendencies

STATEMENTS REGARDING SUPPLIES AND TREND OF PRICES

THE MARKET AT A GLANCE

REVISIONS have been made in some quarters on galvanized and black steel sheets, resulting in an advance in both of these commodities. Steel plate is just the reverse having shown a slight decline. The market is firm at present levels, which are in the form more of a readjustment than otherwise.

Boiler tubes, seamless, show an advance ranging from 5 to 7½%, with lapweld tubes in some sizes similarly affected. These changes, it is indicated, bring prices more in line with latest prices issued by the manufacturers.

The strength of tin features the ingot metal market. During the past couple of weeks, the position of this metal has strengthened materially and advances ranging from four cents to six cents per pound, are shown in the prices quoted to-day. The other metals show no new feature though spelter is weak but remains unchanged as far as price is concerned.

One remarkable thing experienced is the actual difficulty noted in taking care of the business offering with promptness. Manufacturers and jobbers both express difficulty in supplying the trade with their requirements. Business has come along with an unexpected rush and this added to the curtailed production in many lines owing to strikes is resulting in the present scramble for material.

TORONTO, September 12.—Slightly higher prices on galvanized and black sheets have been recorded in some quarters. Boiler tubes have also moved upward to the extent of about 5 to 7½ per cent. Tin is showing strength and has advanced during the week. Jobbers complain that great difficulty is being experienced in taking care of orders, manufacturers being so rushed that deliveries are slow and uncertain. This condition prevails in enamelware, soil pipe and fittings, brass goods, etc., it is said.

Activity Shown in Sales of Enamelware

ENAMELWARE.—Manufacturers' and jobbers' reports indicate decided activity in the sale of all lines of enamelware, with difficulty being experienced in getting the goods out quickly enough to meet the demand Prices are firmly held, and were it only possible to meet demands promptly, all would be happy.

Bath tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide	$37 07
Bath tubs, 5½ ft.	41 27
Lavatories—	
17x10" Apron F139 or P4045	11 00
18x24" Apron F154 or P3845 or P3847.	17 00
18x21" Apron F169 or P4205	12 70
18x21" Roll rim F197, F199 or P4655-6	11 10
17x19" Roll rim F241 or P4345	9.05
Sinks, roll rim, 18 x 30 in.	16 60
Sinks, flat rim, 20 x 30	6.77-6.65
Do., 18 x 30	6.07-6.19
Do., 16 x 24	5.29-5.45
Closets, oak tank and seat	26 50
Do., enamel iron or white vitro tank	30 00

Steadiness Shown in Range Boilers

RANGE BOILERS.—There have been no price changes recorded during the week and the market seems quite steady. Sales are said to be good and outlook for business promising. Quotations to-day follow:

Range Boilers	Standard	Extra Heavy
30-gallon	$11 00	$12 50
35-gallon	13 50	15 50
40-gallon	15 25	17 25
52-gallon	20 50	25 00
66-gallon	32 00	38 00
82-gallon	40 00	47 00
100-gallon	50 00	58 00
120-gallon	60 00	67 00

Difficulty Meeting Demands for Soil Pipe

SOIL PIPE, FITTINGS.—Business has come along with such a rush that manufacturers are being hard pressed to take care of orders for soil pipe and fittings. As a matter of fact, a system of allottisg supplies has had to be adopted to some extent to insure the fairest distribution. Prices are firmly held at following levels:

Medium and extra heavy soil pipe, 2, 3 5 and 6 in.	10%
Medium and extra heavy soil pipe, 4 in..	15%
Medium and extra heavy soil pipe fittings, 2 in. to 6 in.	25%
8 in. extra heavy pipe and fittings	5%

PIPE FITTINGS

Cast iron fittings	10%
Plugs	22%
Bushings	25%
Unions, ¼" to 2½"	40%
Do., ¾", 3" and larger	35%
Dart unions, ¼-inch to 2-inch	25%
Do., 2½-inch and larger	15%
Nipples, up to 4-inch	80%
Do., 4½-inch and larger	70%
Do., running thread 4-in. and under	50%
Couplings, 4-in. and under	40%
Do., 4½-in. and larger	20%

MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittings, Class A, lb.	$0 57	$0 72
Do., Class B, lb. net	0 25	0 36
Do., Class C, lb. net	0 19	0 25

Brass Goods Hold at Recent Advances

BRASS STEAM GOODS.—The recent advances named in these goods are being well maintained. Jobbers and manufacturers report business coming along in

FOR SALE

FOR SALE—PLUMBERS' SUPPLIES OF ALL makes, at prices that protect the plumber. American Plumbers' Supplies, 14 Craig St. West, Montreal.

BRASS ROD For Sale

At a Very Attractive Price

Free Turning

Round Brass Rod

Mill lengths of the following sizes:—	Diameter
30,000 lbs... .250"	¼"
24,500 lbs... .533"	Abt. 17/32"
62,500 lbs... .625	⅝"
73,250 lbs... .750	¾"
27,500 lbs... .9375"	15/16"
46,750 lbs...1.000"	1"
45,000 lbs...1.250"	1¼"
26,000 lbs...1.375"	1⅜"
39,000 lbs...2.000"	2"

Above is all new material stored at the manufacturers' plant in Connecticut, ready for prompt shipment and has passed Government inspection.

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splendid volume. The range of quotations on some of the more familiar lines follows:

Compression work, standard	35
Fuller work, standard	40
Bath cocks, compression	37
Bath cocks, Fuller	40
Flatway stop and waste cocks, standard	38
Roundway stop and waste cocks, standard	38
Brass steam cocks, standard	Net List
Globe, angle and check valves, standard	5-23%
Do., removable disc	10-22%
Radiator valves, standard	15%
Do., removable disc	Net List
Basin Cocks—	
No. 0 and 1, Fuller pattern	40
Compression	30
Quick opening	40

Oakum Readjusted; Waste Unchanged

WASTE, OAKUM.—A readjustment has taken place in prices ruling on plumbers' oakum, to-day's quotations being made at from $10 to $10.75 per 100 pounds, which represents an advance. Cotton waste prices are well maintained at unchanged figures. Trade in both waste and oakum is considered very good.

	Per 100 lbs.	
Best American	$21 00	$22 00
Clipper, spun	.....	21 00
Do., unspun	.....	10 50
Plumbers' spun	10 00	10 75

Wrought Pipe Becoming Scarce

WROUGHT PIPE. — Wrought pipe maintains an unchanged position as regards prices, those shown in list of quotations below being firmly held. The shortage of skelp reported in these columns two weeks ago has developed to a point where a famine is said to exist in ½ inch galvanized pipe, and some other sizes are very hard to procure. Manufacturers claim it will be two weeks at least before further supplies are released. Prices to-day follow:

WROUGHT PIPE
Price List No. 40, July 4, 1919

Standard Buttweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
⅛ in.	$ 6 00	$ 8 00	$.....	$.....
¼ in.	4 53	6 66	5 13	7 26
⅜ in.	4 53	6 66	5 13	7 26
½ in.	5 99	7 57	6 84	8 42
½ in.	7 53	9 66	8 68	10 81
1 in.	11 14	14 28	12 84	15 98
1¼ in.	15 07	19 32	17 37	21 62
1½ in.	18 01	23 10	20 76	25 85
2 in.	24 24	31 08	27 94	34 78
2½ in.	38 90	49 73	.....	.....
3 in.	50 87	65 03	.....	.....
3½ in.	64 86	81 88	.....	.....
4 in.	76 85	97 01	.....	.....

Standard Lapweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
2 in.	$ 27 94	$ 34 78	$ 31 64	$ 38 11
2½ in.	40 66	51 48	46 51	57 33
3 in.	53 17	67 32	60 82	74 97
3½ in.	66 70	83 72	75 90	92 92
4 in.	79 03	99 19	89 93	110 00
4½ in.	88 00	113 00	107 00	132 00
5 in.	103 00	132 00	125 00	154 00
6 in.	133 00	171 00	162 00	200 00
7 in.	175 00	224 00	211 00	259 00
8L in.	184 00	235 00	221 00	273 00
9 in.	254 00	324 00	305 00	376 00
10L in.	235 00	301 00	283 00	349 00
10 in.	303 00	387 00	365 00	449 00

Terms, 2% 30 days, approved credit.
Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Higher Prices Named on Boiler Tubes

BOILER TUBES. — An advance from 5 to 7½ per cent. has been made in seamless boiler tubes and 1¾-inch, 3-inch, 3¼-inch, 3½-inch and 4-inch lapweld tubes are up about 5 per cent. Prices to-day are, it is indicated, more in line with the market on the other side. Quotations in effect are given below:

BOILER TUBES—	Per 100 feet Seamless	Lapweld
1 inch	$27 00	.....
1¼ inch	29 00	.....
1½ inch	29 50	.....
1¾ inch	32 00	$27 00
2 inch	31 00	26 00
2¼ inch	35 00	28 00
2½ inch	43 00	32 00
3 inch	48 00	40 00
3¼ inch	.....	47 00
3½ inch	60 00	44 00
4 inch	75 00	56 00

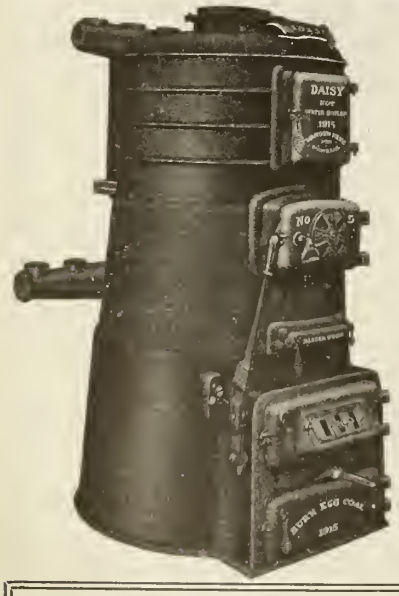
Advance Recorded in Sheets; Plates Down

SHEETS, PLATES.—An advance has been recorded in some quarters in both black and galvanized sheets, and the tendency seems to be towards the slightly higher level. The range of prices on galvanized is still the same, with indications that the $8.00 figure for 10¾-oz., 30-inch width, will be general in another week or so. Black sheets, which have been down considerably in some quarters in an effort to reduce stocks to a more workable basis, are de-adjusted to a higher basis of quoting, as shown in figures below. Plate has been revised downward, ¼-inch and heavier being quoted at $4.25 per 100 pounds.

BLACK SHEETS—		
14 gauge	4 75	5 10

Continued on page 37

Over 60,000 Daisy Hot Water Boilers Now in Use—Are *You* Selling Your Share?



Daisy Hot Water Boilers are easiest to sell because they have an established reputation for exactly meeting the requirements of the modern home.

Every Daisy you instal will help build bigger business by bringing repeat orders for installation in neighboring homes later.

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Because Engineers, Draughtsmen and the Mechanical Men of Canada have found it standard practice.

It has now become a habit—but a habit in which the underlying reason for action is not lost sight of. The supremacy is founded on well established reputation.

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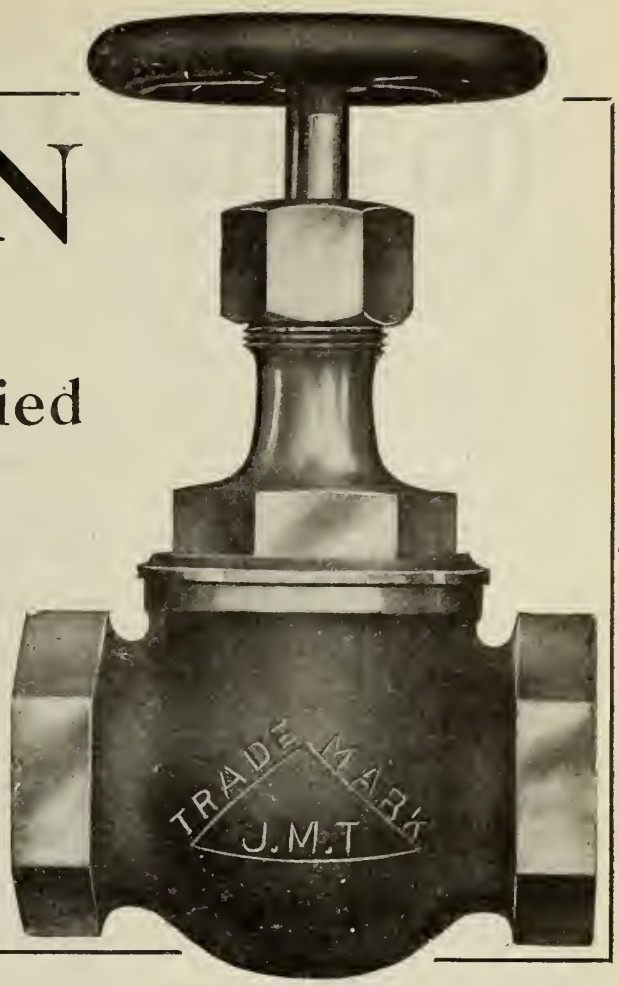

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AIR LINE SYSTEMS
C. A. Dunham Co., Ltd., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

AIR VALVES
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Beaton & Corbin Mfg. Co., Southington, Conn
Canadian Wolverine Co., Ltd., Chatham.
C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co.. Ltd., Sarnia, Ont.
Steel & Radiation, Ltd., Toronto.
United Brassfounders and Engineers, Ltd., Cornbrook, Manchester, England.
Wallaceburg Brass & Iron Mfg. Co., Ltd., Wallaceburg, Ont.

ASBESTOS GOODS
James Morrison Brass Mfg. Co., Toronto.
United Brassfounders & Engineers, Ltd., Cornbrook. Manchester, England.

BOILERS, STEAM OR HOT WATER
Gurney Foundry Co., Limited, Toronto.
Wm. B. Scaife & Sons Co., Oakmont, Pa.
Lord & Burnham Co.. Ltd., Toronto.
Modern Heating & Eng. Co., Ltd., Montreal.
Steel & Radiation, Ltd., Toronto.
Warden King, Ltd., Montreal.

BOILER FEED REGULATORS
Empire Mfg. Co., London and Toronto.
C. A. Dunham Co., Ltd., Toronto.
James Morrison Brass Mfg. Co., Toronto.

BOILER FITTINGS
Fittings Limited, Oshawa.

BOILER STANDS
Fittings Limited, Oshawa.

BOLTS, EYE
J. H. Williams & Co., Brooklyn, N.Y.

BRASS GOODS, VALVES, ETC.
Joseph Breeden & Co., Ltd., Birmingham, Eng.
Canadian Brass Co., Ltd., Galt, Ont.
Canadian Wolverine Co., Ltd., Chatham.
C. A. Dunham Co., Ltd., Toronto.
Empire Mfg. Co., Ltd., London and Toronto.
Galt Brass Co., Limited, Galt.
G. & W. G. Gummer Ltd., Rotherdam, Eng.
Kerr Engine Co., Ltd., Walkerville.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.
Wallaceburg Brass & Iron Mfg. Co., Ltd., Wallaceburg, Ont.

BRASS PIPE AND TUBE
Canada Metal Co., Ltd., Toronto.
Canadian Wolverine Co., Ltd., Chatham.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.
United Brassfounders & Engineers, Ltd., Cornbrook, Manchester, England.

CELLAR DRAINERS
Galt Brass Co., Limited, Galt.
Empire Mfg. Co., Ltd., London and Toronto.
James Morrison Brass Mfg. Co., Toronto.
H. Mueller Mfg. Co., Ltd., Sarnia, Ont.

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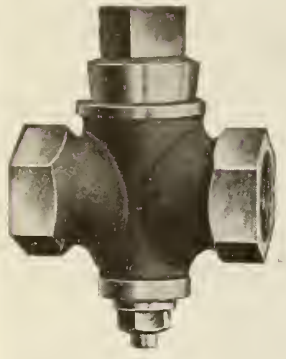

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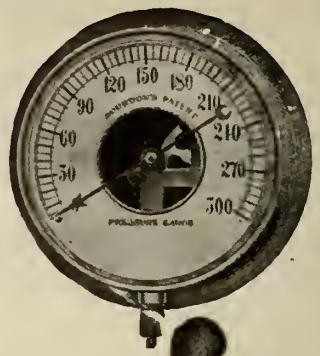

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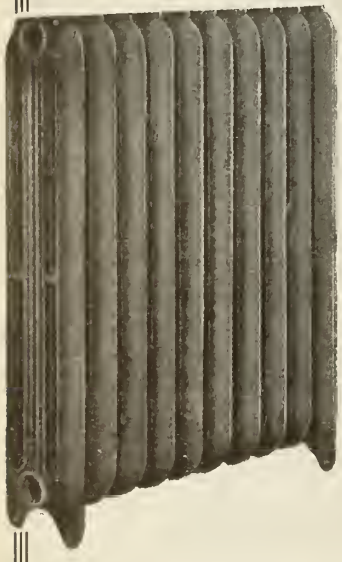

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INDEX TO ADVERTISERS

Allison, Kenneth B. 47
American Technical Society 11
Amherst Foundry Co. ....Inside Front Cover
Anthes Foundry, Ltd. 5
Armstrong Mfg. Co., The 48

Beaton & Cadwell 47
Beaton & Corbin 48
Belanger Regd., O. 47
Borden Canadian Co. 4

Canada Metal 17
Canadian Brass Co. 9
Canadian Tube & Iron Co. 47
Chamberlain Desolvo Co. 46

Dominion Radiator Co. 12

Empire Manufacturing Co...Outside Ft. Cover

Galt Brass Co. .....Back Cover
Gummer, G. & W. G., Ltd., ... 2
Gurney Foundry Co. 38

Hamilton Stove & Heater Co. 48
Hause Mfg. Co., Chas. F. 48
Hoyt Metal Co. 15
Hungerford, U. T., Brass & Copper Co.... 38

Imperial City Heaters 14
International Malleable Iron Co. .....
Inside Back Cover

Jardine, A. B., & Co. 13

Katie Foundry Co. 43
Kerr Eng. Co., Ltd. .....Inside Back Cover

Long & Co., R. G. 46
Lord & Burnham 8

MacDougall & Co., R. 46
MaIntyre & Taylor, Ltd. 11
Moline Heat 5
Morrison Brass Mfg. Co., Ltd., Jas. 41
Mueller Mfg. Co., H. 39
Murphy Victory Co., Ltd. 4

National Steel Tank & Mfg. Co. 41

Port Hope Sanitary Mfg. Co. 18

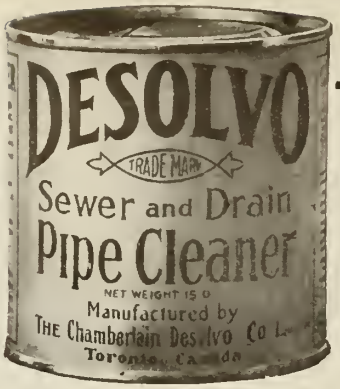
Scaife, W. B., & Sons Co. 43
Steel & Radiation, Limited 14
Standard Sanitary Mfg. Co. ..... 1 & 10

Taylor-Forbes Co., Limited 44
Trimont Manufacturing Co. 46
Toronto Hardware Mfg. Co. 48

United Brass Founders & Engineers, Ltd...44

Warden-King, Ltd. 40
Wallaceburg Brass Co. 6
Wells Bros. of Canada, Limited 3
Williams, J. H. & Co. 11
Wolverine Ltd. 7

X Laboratories 45



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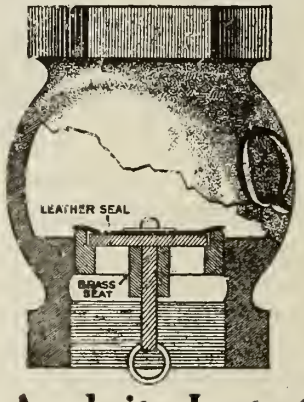

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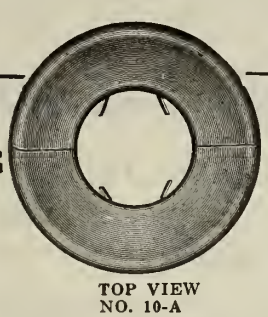

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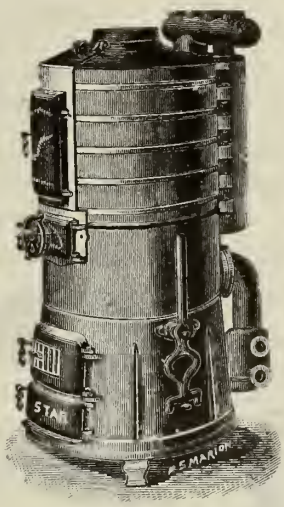

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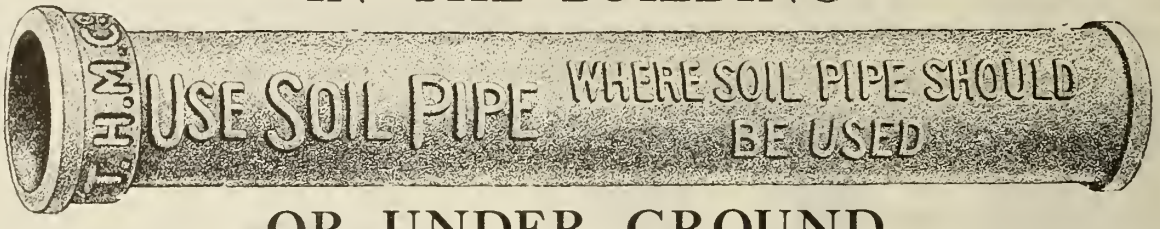


OR UNDER GROUND

ASK YOUR JOBBER FOR T.H.M. CO. BRAND OF SOIL PIPE AND FITTINGS.

TORONTO HARDWARE MFG. COMPANY, - Toronto, Canada

WE MANUFACTURE A FULL LINE OF HIGH-GRADE RANGE BOILERS

"BC" COMBINATION COLD ROLLED STEEL Floor and Ceiling PLATES

Carried by the leading supply houses

No. 15

Puts just the right finish on that heating job

Send for catalog of complete line of "B. & C." goods.

No. 1 Valve

Stock carried by our Canadian Representative W. H. CUNNINGHAM & CO. 183 Church Street Toronto, Ont.

No. 16

No. 17

The Beaton & Corbin Mfg., Co. Southington, Conn., U.S.A. The Old Original Company

GENUINE ARMSTRONG STOCKS and DIES

Hinged Pipe Vises *Pipe Cutters*

Pipe Threading Machines

—MANUFACTURED BY—

THE ARMSTRONG MFG. Company

317 Knowlton Street BRIDGEPORT, CONN

248 Canal Street NEW YORK

"Star Brand" Seamless Brass and Copper Tubes

including

Iron Pipe Sizes

also

Seamless Brass Condenser Tubes

READY FOR IMMEDIATE SHIPMENT

from our New York Warehouses

Also a complete line of Mechanical Cold Drawn Seamless Steel Tubing

U. T. Hungerford Brass & Copper Co., Lafayette, White and Franklin Sts., New York, U.S.A.

Chas. F. Hause Mfg. Co., Ltd.

Manufacturers of the

Hause Closet Auger

Seamless brass tube—high-grade 7-16 steel spring. Made with 3-foot and 6-foot springs.

Ask your jobber or write us direct. Made in Omaha, Nebraska, U.S.A.

Canadian Distributors

Empire Mfg. Co., Ltd., London and Toronto

When writing advertisers please mention that you saw their advertisement in the SANITARY ENGINEER.

Pipe Fittings

Made in Canada

The Brand that has the Quality

M Brand Pipe Fittings, etc., give a service and satisfaction that will invariably get you re-orders and much new business as well.

A trial of the goods will prove this claim.

CAST IRON FITTINGS
With this brand mean fittings made with iron of high tensile strength—proper proportions and correct tappings.

RECESSED DRAINAGE FITTINGS

MALLEABLE FITTINGS
With this brand mean fittings made of Air Furnace Refined Iron, reamed and tapped to gauge with perfect threads

Standard and Extra Heavy Flanged Fittings and Flanges. Galvanizing Malleable and Gray Iron Castings of all Kinds.

International Malleable Iron Co., Limited, Guelph, Ontario, Canada

There Are Lots of Gate Valves

Advertised and Sold

but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES

Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.
Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.
Approved by the Fire Underwriters' Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

A Tank With No Lining

EVERY FITTING TESTED

EVERY TANK GUARANTEED

No Joints to Open

No Lining to Leak

Nearly Half a Million Now in Use

And not a complaint known. This success is based on a plant that is equipped for the efficient production of VitrO Tanks exclusively.

There are no joints of any kind—the tank is all one piece. The trouble is left out, producing a really No-Trouble Tank.

Galt Brass Company, Limited

Galt, Canada

Toronto Office: 67 Adelaide St. E.

Sanitary Engineer

Plumber and Steamfitter of Canada

VOL. XIII. PUBLICATION OFFICE, TORONTO, OCTOBER 1, 1919 No. 19

Indifference to the Stop Cock!

You know what that means.

Ruin to the whole Steam System.

The loss of money and time to the client.

And the loss of the client's confidence in the sanitary engineer who installed the system.

It is worse than folly to pass on inferior stop cocks when Empire Steam Stop Cocks are available — and Empire Steam Stop Cocks always are available.

The factory test of the Empire Manufacturing Co., and our guarantee is behind the engineer who installs our stop cocks. Remember our guarantee has never failed.

A square client deserves Empire Steam Stop Cocks— they are the quality of stop cocks he expects from a reliable sanitary engineer.

Empire Manufacturing Co.
Limited

London and Toronto

Canada

Plate A-810

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While

A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for **BEAVER BRAND CAST IRON ENAMEL WARE**

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

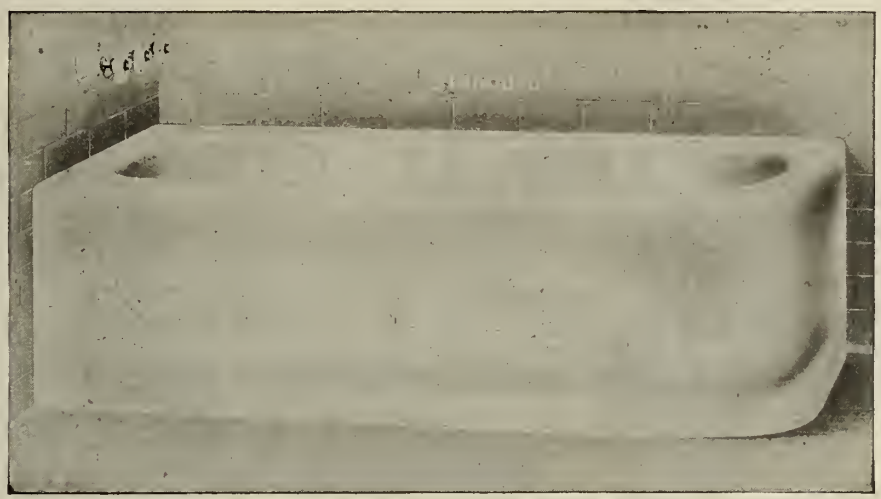
AGENCIES:

ONTARIO:
Monarch Brass Mfg. Co., 71 Brown St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes, 120 Lombard St., Winnipeg

"Standard"
"Perfection" Built-in Baths

Made in One Piece Enamelled All Over



These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in-Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners meaning bathroom sanitation.

Made in 5 and 5½ foot sizes.

Illustrations on request.

Write the nearest dealer

Standard Sanitary Mfg. Co.
Limited

General Office and Factory: Royce and Lansdowne Aves., Toronto, Ontario

Toronto Store:
55-59 Richmond Street East

Winnipeg Showrooms:
76 Lombard Street

Hamilton Store:
20-28 Jackson Street West

Montreal:
358 Beaver Hall Square

Calgary:
325 Eighth Avenue West

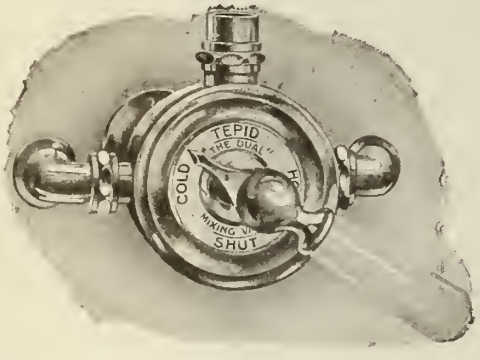
Vancouver:
847 Beatty Street

"MADE IN CANADA"

G. & W. G. GUMMER, LIMITED

EFFINGHAM BRASS WORKS, ROTHERHAM, ENGLAND

And at
9 Fenchurch St.,
London



"Dual" Mixer

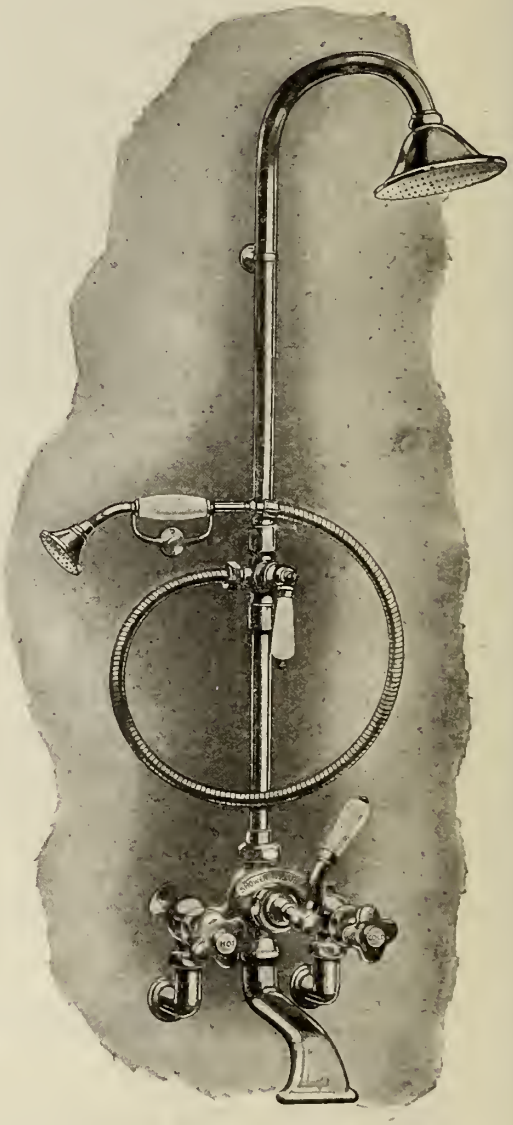
A valve that really mixes Hot and Cold Water, and maintains a uniform mixture.

For ease of operation, simple construction and easy installation, it has set a new standard of efficiency.

Cold Water must be turned on first, no possibility of scalding.

Made in several forms for Showers, Sprays, Operating Rooms, etc.

At the well-known works of Messrs. Brunner, Mond & Co. these valves provide baths for 2,500 employees.



G. & W. G. GUMMER, LIMITED

Manufacturers of every description of

Engineers,' Plumbers' and Sanitary Quality Brassware

The 2-Part Trap

TWO major parts make up this distinctively simple trap: the body, with inlet and outlet connections; the cover, in which the Dunham Thermostatic Disc is securely fastened.

This disc of special phosphor bronze contains a fluid which is extremely sensitive to temperature changes over a wide range—10 pounds of pressure to 15 inches of vacuum.

Temperatures above normal close the trap; temperatures below normal open it for the escape of the troublesome air and water.

Should it ever become necessary to renew a trap, the cost is confined to the top part only. Just screw a new one into place. Judging from some of the original traps (installed 15 years ago) we do not anticipate much demand for new tops.

The complete story of Dunham Heating Service is quite interesting. Write for it.

C. A. DUNHAM COMPANY, LTD., Toronto, Ont.

Halifax
Ottawa
Vancouver

The DUNHAM HEATING SERVICE

Montreal
Winnipeg
Calgary

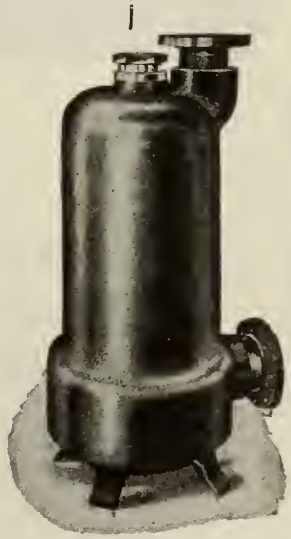
THE MODERN HEATER

Hot Water Heating by Steam

We furnish plans and specifications for Heating and Ventilating Schools and Public Buildings. Central Heating Plants for Groups of Buildings. Laundry and Kitchen Equipment.

Some of the installations we have made, list of many others on application:

Grey Nuns Mother House, Montreal.
St. Vincent de Paul Hospital, Brockville, Ont.
Adam Clark, Hamilton, Ont.
Hagens Convent, Halifax, N.S.
Orphanage St. Joseph, Winnipeg, Man.
Grey Nuns Mother House, Ottawa, Ont.

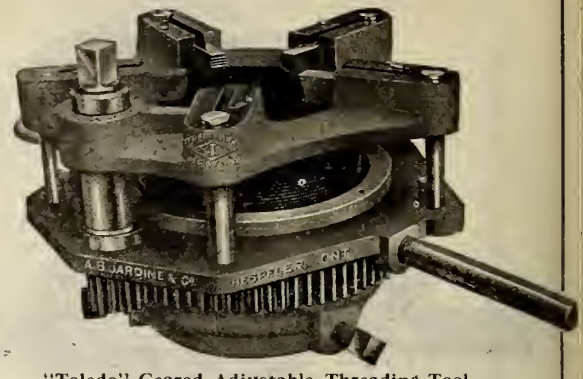


We solicit enquiries from Architects

Modern Heating & Engineering Co. Limited

83 Bleury Street, Montreal, Que.

JARDINE and TOLEDO PIPE THREADING TOOLS



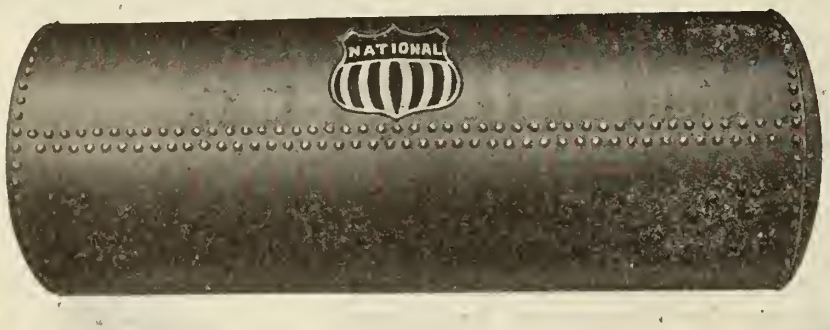
"Toledo" Geared Adjustable Threading Tool
No. 2½. Capacity 2 to 6 in. inclusive.
Weight 120 lbs.

THE ratchet feature of Jardine and Toledo Tools permits their being used to thread pipe which is already in place, no matter how awkward it may be to reach. The Jardine and Toledo have no cams or jim cracks to get out of order; and the dies only cut with the mouth of the cutter. Also, as the tool advances on the thread the dies open out so as to make the proper taper. This means there is no friction on the pipe and every ounce of strength is used in making the cut, so saving time and labor. These are only a few of the valuable features of these tools.

SEND FOR CATALOGUE

A. B. JARDINE & COMPANY, Ltd., HESPELER, ONT.

Sole makers of "Jardine" Pipe-Threading Tools.
Sole licensees to manufacture and sell Toledo Pipe-Threading Tools in Canada.
Agents, Winnipeg and West—Stanley Brock, Ltd., Winnipeg, Man.
Brockville and East—J. R. Devereux, 358 Beaver Hall Square, Montreal.
Belleville and West—W. H. Cunningham & Co., 183 Church St., Toronto, Ont.



NATIONAL

Pneumatic and Storage Tanks

The Factory that builds a perfect tank

Send for prices and discounts.

NATIONAL STEEL TANK AND MFG. CO.

BRADFORD, ILLINOIS, U.S.A.

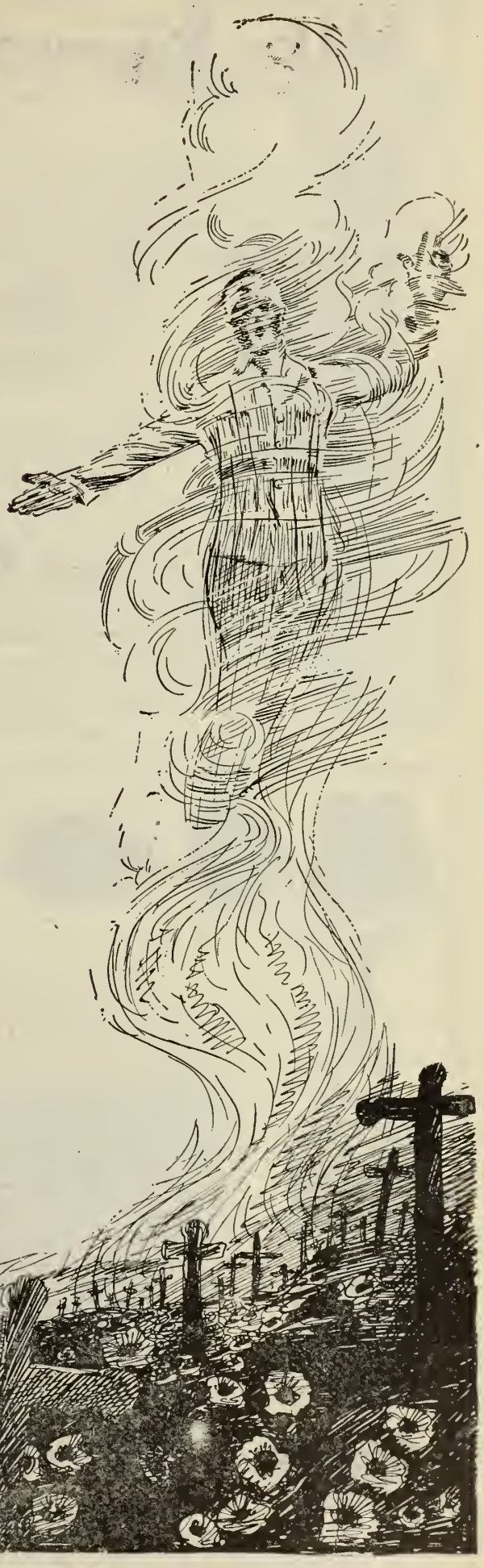
The Soul of a Vision

So then—
My part is ended. Other men,
And women, too, still play their part,
With courage resolute and dauntless heart.

My broken comrade—
Seared by scars that time can not efface,
Is not the jest of fortune; for his aid
A nation's mighty forces doth provide.

And those who live—
To carry on our story down the years,
Face not their "quiet days" in bitter pain;
(Forgotten, now they've stilled the nation's fears)
Dwarfed by the lust of pride and selfish gain.

My Canada—
Thou fair land for whom great love
Inspired my youth to ancient sacrifice;
Grant that our serried ranks in realms above
May witness bear thee, worthy of the Price.



To Pay Debts of Honour

TO the Dead and to the richness of their dying, we must give pause, and in humility confess a debt beyond redemption.

Before the altar of their sacrifice, Canada is consecrated to make its dominion worthy. The Torch that illumines Victory so dearly bought, must burn eternally. Each year of peace must record an added lustre to our heritage.

But to those who have come back in suffering Canada owes a debt which money can, in part, repay.

It is a Debt of Honour. Canada was pledged to the end, that the wounded and the sick be adequately cared for, until they were fairly fitted for the competitive existence of civil life.

For this purpose, our medical services, and our vocational training schools must be maintained until the need for them is no more.

* * * *

These, then, are some of the purposes for which the Victory Loan, 1919, is being raised. Other purposes are told about in other announcements.

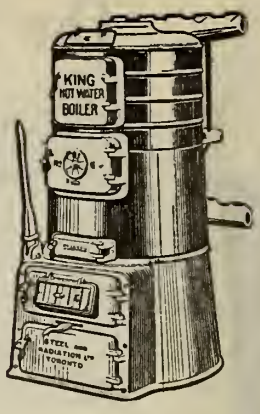
As you read them, the conviction will grow upon you of the absolute necessity for the

VICTORY LOAN 1919

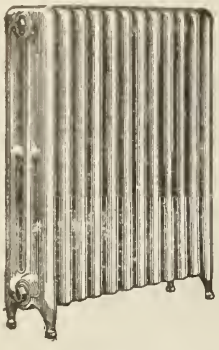
Issued by Canada's Victory Loan Committee
in co-operation with the Minister of Finance,
of the Dominion of Canada

10-P

Make Every System A Salesman



Now that cold weather stares us in the face, people are thinking of hot water systems. The only way to efficiently heat a house is by hot water. There are many good prospects right near you. Talk hot water systems to your friends. There is nothing more disappointing than the installation of a faulty system. Bad news spreads like wildfire, and your store will be blamed. Don't run the risk.



KING HOT WATER BOILERS AND IMPERIAL RADIATORS

form a reliable, unbeatable heating system. The King Boiler is very economical on fuel, while Imperial Radiators are extra rapid radiators of heat. You are assured of having highly satisfied customers who will tell others of their comfort and so new prospects are created for you.

STEEL AND RADIATION LIMITED

Manufacturers of Hot Water *and* Steam Boilers *and* Radiators; Fenestra Steel Sash *and* Concrete Reinforcing

Head Office:—Fraser Ave., Toronto Sales Offices:—Montreal, Toronto, Quebec

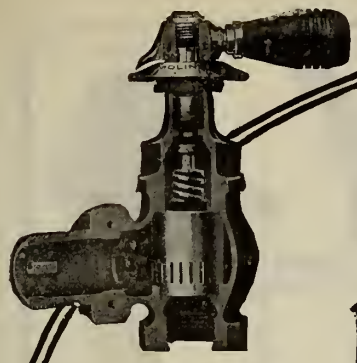
Western Agents:—The J. H. Ashdown Hardware Co., Limited, Winnipeg

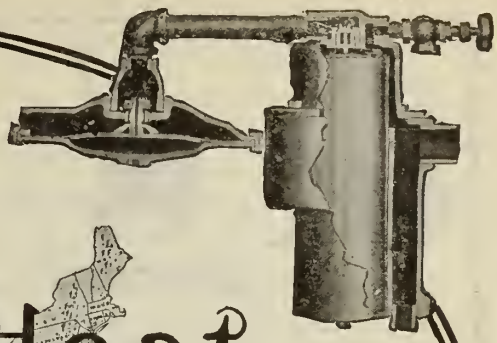
A complete stock of all lines is carried at our Montreal warehouse.

The Home of "DIAMOND" Fittings

FITTINGS LIMITED

OSHAWA, CANADA

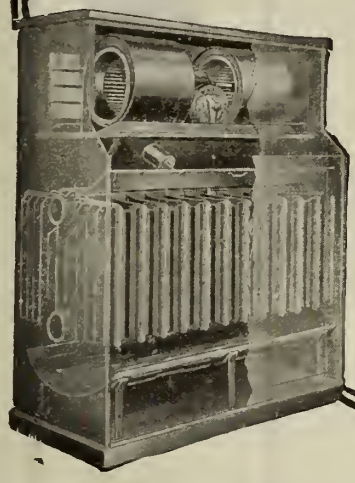




A GOOD LINE of Equipment for YOU to sell—

Moline Heat

EVERYWHERE



Moline Heat — System of Steam Circulation and Control

UNIVENT — Last Word in Combined Heating and Ventilating

"LIVE OUTDOORS—INDOORS"

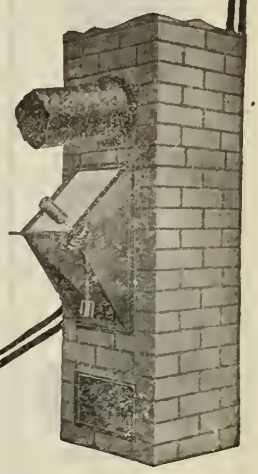
Liberty Draft Controller — and other products

Write for Complete Line of Catalogs TODAY

Address Dept. G

MOLINE HEAT

Moline, Ill.



Over 60,000 Daisy Hot Water Boilers Now in Use—Are *You* Selling Your Share?

Daisy Hot Water Boilers are easiest to sell because they have an established reputation for exactly meeting the requirements of the modern home.

Every Daisy you instal will help build bigger business by bringing repeat orders for installation in neighboring homes later.

WARDEN KING, Limited, Montreal

BRANCH OFFICE: 136 SIMCOE ST., TORONTO

Planing Mill Fan

No. 2 Vacuum Cleaner

Sturtevant (TRADE MARK)

SYSTEMS

Autoforce Ventilator

Steam Turbine

Electric Propeller Fan

Medium Pressure Blower

Sturtevant Supremacy

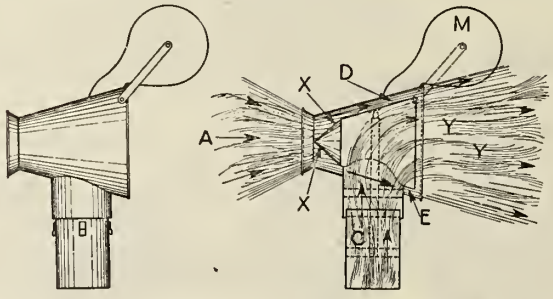
For upwards of 60 years the name Sturtevant has been pre-eminent among makers of air-moving apparatus. More Sturtevant apparatus is now in use than all other makes combined. Isn't that fact significant? All Sturtevant products are built to an ideal based on—

Quality—Efficiency—Economy

Where Mechanical Vent Not Required, Here Is Better Natural

VENTILATION

At Lower Cost



Low Pressure Blower

High Pressure Blower

Volume Blower and Exhauster

Gasolene Generating Set

Autoforce Ventilators

—are the logical solution to the ventilating problem of factories, foundries, tanneries and garages. Economical, efficient, reliable. **Will displace three times as much air as ordinary ventilators.** No power required, practically no upkeep cost.

Because of their superior efficiency, fewer autoforce ventilators are required—than other natural ventilators to perform the same task.

It will pay you to request our Autoforce catalogue! No. 232

Turbo-Blower

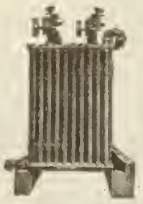
Direct Current Motor

B. F. Sturtevant Company of Canada Ltd.

GALT, ONTARIO, CANADA

MONTREAL WINNIPEG TORONTO

Type H Air Washer

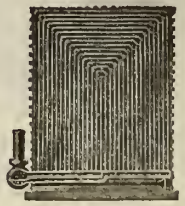


Fuel Economizers

Sturtevant (TRADE MARK)

PRODUCTS

VS-7 Steam Engine



Heater

Today and Tomorrow

A Little "Straight Talk" to the Canadian Plumbing Trade

TO-DAY is ever present. Its problems are so close to us that they frequently obscure the future. "TO-MORROW can look out for itself; I'll enjoy to-day while it's here," is the life motto of many men, both in business and private life.

TO-MORROW can be made the Golden Day by using TO-DAY at its best; by making the worries of TO-DAY into warnings for TO-MORROW, making TO-DAY'S lessons help us to build greater success in the future.

TO-DAY business may seem to be at its height, buyers frequent, prices soaring, everything running at high pressure. Let us be grateful for these good things, but without pessimism let us build for possible TO-MORROWS when there may be a falling back of the tide of prosperity.

TO-MORROW and its success or failure will be built on how well we have done to-day. The workman who has done his work efficiently will be first in demand when **Service** is required; the business man who has had Quality as his guiding light will be remembered by pleased customers and clients. Confidence will beget new business and greater profits. The care and thought devoted to to-day's work, to the small contract as well as the large one, the class of goods employed, the efficiency of workmen employed will build for the future of the business man individually and the nation as a whole.

TO-DAY anticipates TO-MORROW. The Canadian Plumber has now an opportunity which can be used with the very best effect for himself and his community. Keep always this watchword in view:

"Quality," "Efficiency" and "Service"

TRADE B.O.T. MARK

THE CANADIAN BRASS CO.
LIMITED
GALT, ONTARIO

CANADIAN BRASS GALT ONT

THE CANADIAN SOCIETY OF DOMESTIC SANITARY AND HEATING ENGINEERS

President
Frank R. Maxwell, Toronto

Vice-President
Harry Mahoney, Guelph

Secretary-Treasurer
Garrett F. Frankland, Toronto

Are You With Us?

This society aims to improve the standard of Sanitary Plumbing and Heating throughout the Dominion of Canada.

To do this, we require the assistance of every Sanitary and Heating Engineer in the Dominion of Canada.

FIRST—To become a member of this Society, either directly or through his Provincial Society if there is one.

SECOND—To have improved Sanitary Plumbing By-Laws adopted in his own city or town, and also Provincial Plumbing Regulations enacted for his Province.

THIRD—To improve the standard of Heating Installations and have enacted Local By-Laws and Provincial Regulations for the enforcement of such standards and safety measures, that will ensure to the public, satisfaction, protection and economical heating systems in their buildings.

FOURTH—To raise the business ability of those engaged in the Plumbing and Heating Industry to the highest standard of efficiency.

FIFTH—To inaugurate Apprenticeship Regulations throughout the Dominion of Canada, to assure capable, reliable and efficient Plumbers and Steamfitters for our business.

Has your Municipality any Sanitary Plumbing or Heating By-laws?

Kindly notify the Secretary accordingly, forwarding copy, if you have same.

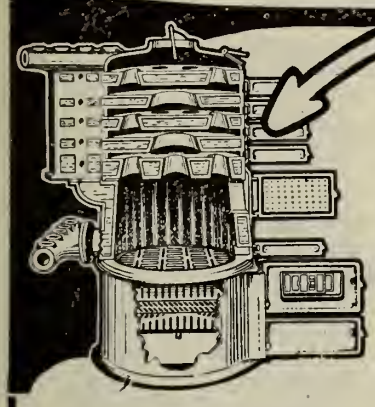
Remember we are ALL FOR ONE and ONE FOR ALL,

Thanking you for your co-operation,

FRANK R. MAXWELL, President

Address all Communications to
Garrett F. Frankland,
Secretary-Treasurer,
Room 303, 22 College Street,
Toronto, Ontario

WHY "THE SOVEREIGN" HAS INDIVIDUAL CLEAN-OUT DOORS



Efficiency Detail in "Sovereign" Hot Water Boiler

"Individual Clean-Out Doors" is one of the minor features of improvement in the "Sovereign" Hot Water Boiler. It shows how finely the idea of conserving heat has been worked out. Opening only one door at a time, while removing soot or ashes from between the boiler sections, prevents unnecessarily chilling the heating medium.

The principals of the Taylor-Forbes Company introduced the screw-nipple wall radiator in Canada, and are the original designers of the **largest first section** in Hot Water Boilers, a feature which is now widely copied or imitated.

Follow the line of least resistance —"Sovereign" Boilers and Radiators make sales easy.

Taylor-Forbes Company, Limited

General Offices GUELPH, ONT. Works and Foundries

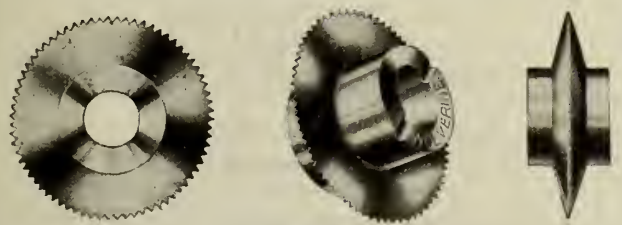
Taylor-Forbes Branches:

Toronto—1066-1088 King St. West.
Montreal—246 Craig Street West.
Hamilton—92 Delaware Avenue.
Vancouver—1070 Homer Street.

Taylor-Forbes Agents:

Halifax—Guilford & Sons, Ltd.
St. John—W. H. Campbell.
Quebec—Mechanics' Supply Co.
Ottawa—Gerald Watkinson, 116 Flora St.
Winnipeg—Vulcan Iron Works.
Calgary—Canadian Western Mfg. & Supply Co.
Regina, Sask.—Engineers' & Plumbers' Supply Co.

Wolverine Steady Sellers

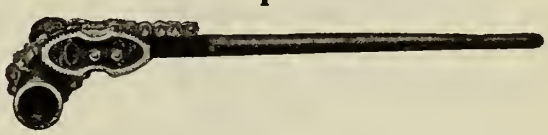


Saw and Fine Edge Cutters

There is a long, long line of Wolverine Products and a long, long rosy trail of profits for the dealer who handles them. For lack of space we can show but two here. See Wolverine Kantleak Floats, Wolverine Coil Furnaces, etc. Write for catalogue and discounts.

Wolverine
Limited
12 Mercer St.
Toronto
Ont.

Williams' Improved "Vulcan" Drop-Forged Chain Pipe Wrench



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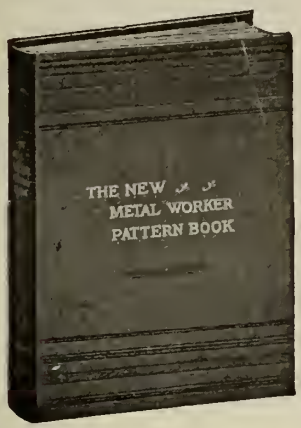

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SANITARY ENGINEER
PLUMBER AND STEAMFITTER OF CANADA

ESTABLISHED 1907 PUBLISHED TWICE MONTHLY

Vol. XIII. TORONTO, OCTOBER 1, 1919 No. 19

CONTENTS

Sanitation is Solving Rural Problem 17-18
Will the New Montreal By-laws Carry Improvements? 18
Where Would You Draw the Line? 19-20
What Are the Powers of the Board of Commerce? 20
Keep Your Stock Before People 21-22
Saving Fuel in Heating a House 23-25
Col. George Nasmith Resigns 25
Editorial Comment 26-27
News From Here and There 28-29
Heating and Ventilating 30-33
The Heating of Theatres 30-31
Ventilating the Modern School 32-34
The Question Box 35-36
Market Conditions and Tendencies 38-40

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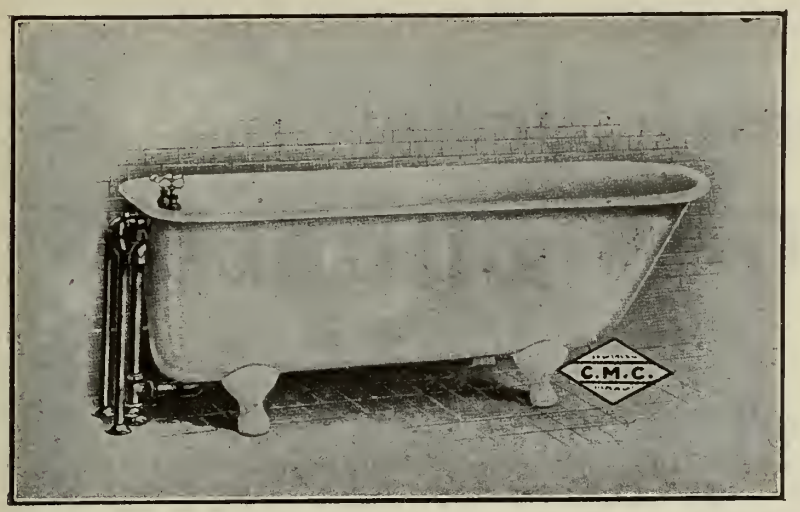

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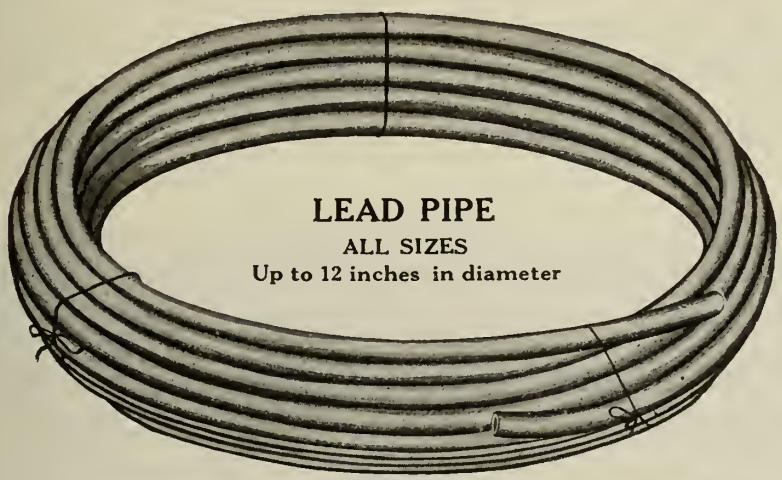

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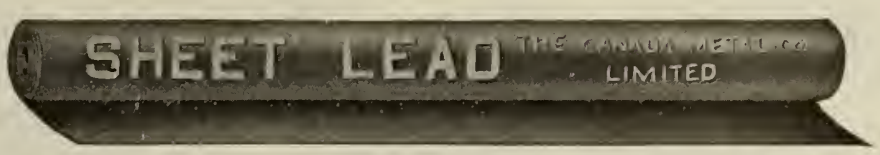

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Sanitary Engineer
Plumber and Steamfitter of Canada

Published First and Fifteenth of Month

Vol. XIII. TORONTO, OCTOBER 1, 1919 No. 19

Sanitation is Solving Rural Problem

Installation of Modern Conveniences in the Home is Doing More Than Anything Else to Keep the Boys and Girls at Home—Splendid Opportunities For Business in Rural Communities

BECAUSE of the apparent spread of public discontent, some concern for the stability of our institutions has been expressed by students of social science.

One writer states that Cincinnatus will not go back to his plow, or if he does it is only to stand between the handles while he wrangles over his wage. Another writer has succeeded in putting a flippant song in the mouths of the populace whereby they may question how the boys are going to be "kept on the farm after they have seen Par-ree."

The farmer of to-day is not greatly exercised about keeping his boys on the farm; he has found the way.

Found the Answer

The farmer knows that it was not so much the lure of the city as it was the inconveniences of the old farm homes that at one time depleted the rural districts of their population. He knows that more boys were driven from their homes by frost-bitten bedrooms than were drawn to the cities by the bright lights. So to-day he provides his home with the modern conveniences and fosters in his children a desire to remain where their prosperity is reflected more in a growing value of the better things of life than in rampant commercialism.

With the growing ease of travel there has come to the tiller of the field a growing consciousness of the dignity of his calling and a self-respect demanding the things that should be his by right of conquest of the soil. So all over the country there is to-day a vitality of movement in the rural districts pointing to a development of national character founded on the firm base of a disciplined love of home.

Has the Means

The farmer of to-day has the means of providing a home for his family that is more desirable than any home in the city, and he knows that the ability of the home to hold the affections of its children means more for the purity of

There is no better way of getting business than by getting a good stock and letting people know you have it. The attractively arranged display shown in the illustration has meant real money to the Hunt Plumbing Co. of London, Ont., and the combined window and store display has brought many people in who became buyers.

the aspirations in rural life than city dwellers realized.

It was true that in the time of the city-ward drift of the human stream there were conditions of life existing in our rural districts, that, had they persisted, could have only resulted in the sinking of our farm dwellers to their status of a peasant class with outlooks as circumscribed by ignorance as profound as their natural surroundings were glorious.

Only a Memory

Happily those conditions are only one of the dismal memories of the past and now we look with confidence to where the roots of every civilization have been planted—the farm.

No matter what storm of social unrest threatens the fabric of our urban life, we know that there is hope so long as the foundations are not torn from their base, therefore we take encouragement for the future when we consider the wonderful prosperity of our farming communities.

It has been the history of every race of mankind that when the farms were in the hands of the enlightened and prosperous class of men the national life was free from the leprous touch of public immorality and decay of national character.

The roof that shelters generation after generation has a sacredness that cannot be carried into the dark and dirty streets of our cities; and while the city must ever be a partner in the prosperity of the rural abstracts, the city dweller can never experience within the walls of his restless habitations the proud and honorable self-possession of the home of his fathers.

A Pitiful Thing

It is a pitiful thing and full of sorrow for our people when they cannot know the memory for the old family home—a memory that should be the heritage of every man belonging to a native race.

When there is so much in the nature of man that binds their affection to the land that gives them sustenance, it would seem strange that new desire for variety and change should tear them away from their peaceful walks in life to set them struggling amid the dust of city streets.

Are Coming Back

Now that farm homes are being fitted with so many of the modern conveniences of life we find that many young men who could take a leading part in the activities of the city are returning to the farms, knowing that in these days that the farm home has so much to make it desirable as a permanent dwelling place.

The farmer in his growing wealth feels that the desire for higher standards of living conditions demands greater refinements of culture, and it is not long before he realizes that there can be no real culture where pools of stagnant water covered with slimy scum may be seen, or where household debris and garbage become an offense.

Are in the Farm

The roots of civilization are in the farm, but the indications of superior civilization is self-respect. Not vanity, but self-respect, and there is no better token of self-respect than the well-used bathroom.

Of the men that walk in industrial life there is none to whom more is due than to the sanitarian. He has done more to stamp out malignant disease than all of the medical profession that have lived since the days of the father of medicine.

With a quickening civilization there is always a marked activity of the plumbing trades, and this higher type of civilization shown in the growing prosperity of our rural communities gives a promise of an ever-increasing interest in the necessity for sanitary convenience on the farm.

A Fruitful Field

But it is not alone on the farms that the rural sanitary engineer finds a fruitful field for the practice of his art, but also in the towns and villages where the new community spirit, and the use of the automobile, with the consequent better roads is developing a social life that is resulting in the building of superior places of public assembly. These buildings require the best equipment of heating, ventilating, plumbing and lighting fixtures. Here as well as in the domestic field is another demand for the superior services of the high grade sanitary engineer.

Will the New Montreal By-Laws Carry Improvements?

Committee of Master Plumbers Has Worked Conscientiously to Try and Get Good Laws Which Will Not Be a Burden to House Owners

LONG and weary hours have been conscientiously given the consideration of the proposed new plumbing by-laws for the City of Montreal by the committee of Master Plumbers, appointed by the Montreal Master Plumbers' Association. Will the amendments they have proposed be adopted and embodied before the new law goes to the printer?

As head of the committee which has been giving attention to these laws for several weeks past, Chairman P. C. Ogilvie has given a great deal of time from his personal business in an effort to conserve the best in the proposals and to eliminate the unworkable and cumbersome clauses.

Want Fair Laws

"We desire to have a good law but one that will not be a burden to the house owner," said Mr. Ogilvie to SANITARY ENGINEER. "There has been a desire on the part of some to have a lot of clauses in the by-law which will not be of value and which would only mean unnecessary expense for the parties having work done. The plumbers are anxious to have a good law but one that will work as little hardship as possible on anyone."

Knows His Work

Mr. Ogilvie is a past master in work of this kind and has been called in to revise and advise in matters of this kind in Montreal and Westmount for the past twenty years. Naturally he has learned a great deal through this experience, and it is his earnest hope that when the by-laws, with the recommendations attached from the plumbers' committee are sent to the civic authorities, they will adopt them. The point in simplicity is this: That the master plumbers know what are good laws and what poor. They know what rot red tape is and want to see it cut out. It is as much in their interests to see that the new laws are good laws as it is to anyone—of greater interest and moment, in point of fact.

In Effect Shortly

Just what will be done, and when? As far as SANITARY ENGINEER has been able to learn from the officers of the association in Montreal, and from the civic sanitary department, the laws should be in the printers' hands within a month or six weeks. That would mean that they should be available by the end of October or early in November. Good plumbers have followed the consideration of these proposals with interest, meetings have been held and much time spent in careful meditation over them. If the Master Plumbers and Steamfitters and Heating Engineers are given the consideration they merit, and if the best interests of the public at large are fully safeguarded when the final draft is attested, there will be little complaint from the craft here.

BUILDING IS BRISK

Tenders are to be called for by the City Council of St. John, N.B., for the erection of eight new houses, averaging about $3,500 each, under the Government Housing Commission. Plans are under way for the erection of thirty-two other buildings of a similar nature. The whole will represent an outlay of about $150,000. A similar outlay is being made in Moncton under the Housing Board, but the work is more advanced, twelve of the houses now being ready for the plaster and twenty-eight more being in process of building.

Where Would You Draw The Line?

John A. Lillie, of Toronto, Would Allow No Undesirables to Enter the Profession of Sanitary and Heating Engineering in Canada—Suggests a Seven-Year Term For Apprentices

Based on an interview by C. E. PARSONS, of Sanitary Engineer, with John A. Lillie, of Toronto

"I THINK the time has come in the interests of the sanitary and heating profession in Canada to raise the general standard of the trade by drawing the line and excluding certain persons from practising. I do not think any undesirables should be allowed to work at our business. My reason for this is that people from some countries have no conception of our standards of living, especially in regard to sanitary arrangements or general cleanliness, and few of them apparently want to learn."

This is the view of John A. Lillie of 311 Roncesvalles Avenue, Toronto, as given to SANITARY ENGINEER.

Raise the Standard

"Throughout the trade," said Mr. Lillie, "there is an urgent need for the men in it to raise the standard. Few of the sanitary and heating engineers place the proper estimate upon themselves or the importance of their work to the community. Community health and national health is of vital importance. There is nothing that concerns us more, and yet if every man in the trade were to take a holiday for a very short time there would be a complete demoralization. Can you imagine what would happen if every man in the trade laid off for three months? Conditions, especially in the populous centres, would be terrible with disease epidemics and increased death rate everywhere. The sanitary and heating engineers have done more to make the health and comforts of the modern home possible than anyone, and yet is our work appreciated? What is the status in the minds of the average citizen of the plumber? Is he given credit for what he does or for the service he tries to render to the general public? Most emphatically he is not.

What Would Happen?

"If every man in the trade to-morrow morning took down his sign as a plumber and replaced it by hanging in the window his license as a sanitary and heating engineer, the public would begin to take notice. Because the men in the trade have too low an estimate of themselves, the public takes them at their own estimate.

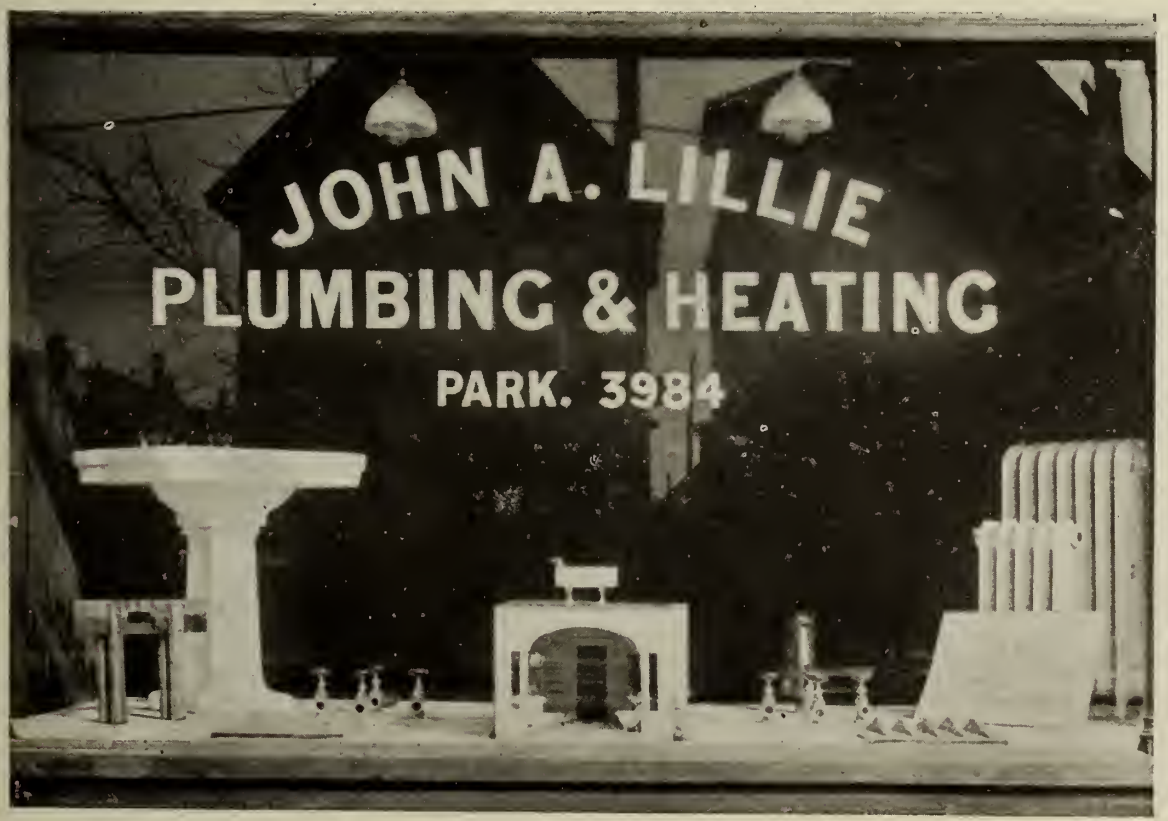
"I think it would be a good idea if every man who is a qualified sanitary and heating engineer wore a uniform so that people would know to what profession they belonged instantly. In my opinion, every qualified man should wear a badge also. It he went out on a job the householder would know as soon as he showed the badge that he was a man who had passed certain examinations and was competent to do certain work. In this way the public would be protected from men who are not properly qualified, but who will take on work about which they know little every time they get the chance."

The Apprentice Problem

Mr. Lillie regards the apprenticeship problem as one of the most important matters that the trade has to solve today.

"I think the term that apprentices serve should be lengthened," he said. "I would make it seven years instead of five as at present. We would then get the boys who wanted to be sanitary and heating engineers into the business. They would come in because of a true love for the work. Sanitary and heating engineering is a real business. There are all kinds of jobs where real skill is required and installations where real pride can be taken in planning and executing the work. Take for instance, such jobs as the heating and plumbing installations in some of the big modern office buildings and hotels.

"To my mind the public needs to revise its attitude in regard to plumbers' apprentices. At the present time, very often, if a boy is sent out with a man,



In his window displays which are changed regularly, John A. Little aims always to keep before the people of his vicinity, goods of the finest quality and educate them to buying this class of goods. He says he gets splendid results from his window displays.

protests are made that it is not necessary to send two men. The public should bear in mind that the boys have to learn and that the only way for them to learn is to get the actual experience by doing the work and seeing how good workmen do it.

Technical Education

In connection with the apprentice problem, Mr. Lillie also believes that more attention should be given to technical education for the boys. A great deal can be done, he believes, to improve matters along this line and provide instruction along the right lines for the boys who are learning the business.

Mr. Lillie believes that every man who is in business should go after business aggressively. Sitting still and waiting for people to come to you is not his idea of getting along. He has two shops and each is located in the heart of two of the best residential districts in Toronto.

"Good goods, good work and good service," said Mr. Lillie, "are my ideas of the foundation of a good business. No man can have a better advertisement for his shop than satisfied customers. They not only come back to him for future work, but they tell their friends and very often bring them.

Don't Mind Expense

"My policy is that no matter whether it is cleaning out a furnace or installing a lot of costly equipment, the job must be done right and the customer satisfied."

Just in connection with this little matter of cleaning furnaces it might be mentioned that Mr. Lillie has worked out a system that is not only fast and efficient, but profitable. He devised a motor equipment which works like a vacuum cleaner. With this apparatus he can go into a man's cellar and in short time thoroughly clean out a furnace and pipes then, if there is any soot or dust on the floor he can, in a few minutes run over it and leave everything spic and span. It takes only a short time to do a thorough job and one which satisfied the customer thoroughly, and for which he is willing to pay a price that leaves Mr. Lillie a good profit.

"I have calls every season from people who have moved away from Toronto," said Mr. Lillie. "One man over at Niagara Falls sends regularly to me to have this work done. He says he knows it will be done right. I told him when he first wrote in that owing to the distance it would be cheaper for him to get somebody at the Falls to do the work, but he said he wanted me to do the work and that the expense did not matter. I have several clients of this kind. It pays to have people think that much of your work."

Good Show Window

Mr. Lillie regards his show window as one of the best advertisements he has for his store. He gives it especial attention and always has a neat and attractive display arranged in it. As will be seen from the accompanying illustration it is not a large window, but it is used to good advantage.

Just how much importance people pay to display windows may be shown by a simple case recently. Early this month Mr. Lillie put in a large display card being the notice: "Get Your Furnace Cleaned Now. We Will be Busy Later." Within a week twelve new customers had called at his shop. Besides this, regular customers had phoned up to tell him not to forget them.

Use The Telephone

In conjunction with the telephone, Mr. Lillie states that 75 per cent. of his business comes in from telephone orders. He uses an advertisement in the telephone directory and says it has produced excellent results. In a district where new homes are constantly being erected and new people moving in Mr. Lillie says the telephone directory keeps his name before them.

"People who have recently moved in or who are not familiar with the firms in this district," said Mr. Lillie, "look in the telephone book just as quickly as there is trouble and they want a plumber. I get a lot of business in that way. They see my ad. in the telephone directory and call at once."

Other Mediums, Too

Mr. Lillie also uses newspaper space and the movies for advertising purposes. Every night his firm name is flashed to the crowds in one of the leading movie theatres in his section of the city.

"If this were only done occasionally," said Mr. Lillie, "it would have little value, but when it is done night after night and all through the year it impresses upon the people the name of John A. Lillie, and also that he is in the plumbing business."

A large street sign is also used by Mr. Lillie to direct people to one of his stores. It is always kept in good shape by being frequently painted and gives directions as to his shop. He gets good results, he says, from this.

Good Store Display

An attractive store display is a big help in business, he says. As will be seen from the illustration of the interior of his shop, he keeps an attractive showing of goods out where everyone who comes in can see it. In this way he sells a lot of goods, especially such lines as gas stoves and bathroom equipment. It takes time to keep this stock looking its best, free from dust and shiny, but Mr. Lillie says it is good business.

This summer he tried out a new stunt in the shape of handling high-priced lawn mowers. It occurred to him that in a district such as he is located in where there are a lot of new homes and well-built homes at that, that there was going to be a demand for lawn mowers. He got in a few of the best he could secure and placed them in a window. Within a short time he had sold a number, and during the season disposed of many more.

At the present time he is seriously considering handling electric fixtures, for which he believes there would be a good demand in his territory.

A Good Collector

Mr. Lillie has learned, he says, that one of the essentials of carrying on business is to be a good collector. It pays, he says to do business in a business-like way.

"Whenever I make a purchase of goods," he said, "I get an invoice the next day. I follow exactly the same plan in my business. As soon as a job is completed an invoice is sent to the customer. He knows then exactly where he stands. Collecting is an important matter. A good deal of tact has to be used. There are cases where, if we did not collect immediately, we would never get our money. There are other cases where the people are perfectly all right, and where, if we made an immediate demand we would lose their business and offend them. We do not take any chances on people that we do not know all about."

What Are the Powers of the Board of Commerce?

This is a Question That is Being Frequently Asked. It is a Question About Which There is Some Doubt. The Actual Powers of the Board and the Authority Under Which It Gets Its Powers Are Here Stated

THERE has been some uncertainty in regard to the powers and jurisdiction of the Board of Commerce. There are some who are inclined to doubt that it has the powers that the commissioners are claiming for it. There can be no real doubt on this score. The scope of its operations and its powers have been very definitely set by two acts recently passed by the Dominion Parliament.

"The Board of Commerce Act" and "The Combines and Fair Prices Act" were passed at the last session of the Dominion Parliament and came in force on July 7, 1919.

The Board of Commerce of Canada is a tribunal created under this act to enforce the terms of the "Combines and Fair Prices Act," which act relates not only to fair prices, but defines the offences relating to combines, mergers, trusts, monopolies, etc., but does not in-

Continued on Page 22

Keep Your Stock Before People

McKelvey & Birch, Ltd., of Kingston, Ont., Have a Splendid Showroom and Get Excellent Results From Their Displays — Newspaper Advertising Has Also Brought in Some Fine Business

THE plumbing department is one of the most important in the whole of the big business of McKelvey & Birch, Ltd., Kingston, Ont. The stock carried is extensive and the business handled of large volume, and altogether this is one department which has developed to a point where it is almost considered in the light of a separate business.

And in a way it is just that. There is no little corner with a sink or a basin to form the display. There is a real showroom which provides an opportunity for customers to make a selection easily and by comparison with the various types of goods available. The accompanying photographs give some idea as to the arrangement of the display.

All Easily Seen

The baths, closets and basins are all arranged where easily seen, and on the wall above will be seen mirrors, medicine chests and bathroom fixtures of many kinds. Attention was also drawn to the arrangement of shelving for carrying bibbs, cocks, and various lines of brass goods. This is not a new method but it is one too seldom employed. Advantages are the constant display of the goods when sampled on the front of the drawers; an arrangement of stock where it is easily and quickly available and the care with which stock can be taken and orders for material running low can be placed.

Daily Check on Stock

The stock of pipe, fittings and various plumbing supplies is arranged on the floor above the main floor and in the cellar below. A daily check is kept so that the amount of goods on hand is always known. The firm employs a card index system by which every item carried in stock is listed. Slips for all the material used on a job are filled out daily and deductions made from the cards. It is possible by this system to determine at all times the amount of goods on hand without leaving the office for a trip to the stock rooms.

Watching the Work

Another point in connection with the sanitary and heating work is the close check kept on the work done by the men. As soon as a certain job has been completed, time cards and list of material used are sent in to the office, and in fifteen minutes the foreman of the work is advised as to whether the firm has made any money on the job or not. If not, there has to be some satisfactory explanation forthcoming—if so, the foreman is told of that, too, and commended when the figures prove to be on the right side of the ledger.

Feel Responsibility

"We are not just looking for a chance to complain and find fault when no money is made," explained Mr. Druce. "We want the men to feel some responsibility in their work and an interest in turning in profit making cards. We are far happier to be able to say to the foreman of the job, 'Well done,' than to have to criticize—not alone because money has been made, but from the fact that we all like to be making a success of the work in hand, no matter what it may be. Incidentally, I might say that we were able last Christmas to share a mighty nice little stake with our employees, so they realize that it is to their interest as well as ours to show a profit on the work they are doing."

Arranging Displays

Displays form an important part of the work done by the advertising man. Not only does he prepare newspaper copy, but he arranges the windows to correspond with the goods advertised in the papers. The floor display is also suited to the advertised lines, and in this consolidation of effort splendid results are obtained.

Windows are Current Events

One rather good idea carried out from time to time in the window displays is linking up the store's merchandise with

Show room of plumbing supplies in the store of McKelvey & Birch, Ltd., Kingston, Ont. It will be seen that the various sizes of tubs, styles of basins, etc., are out where prospective buyers can see and determine upon the types which they consider best adapted to their use. This display is in plain view from the street through a big plate glass front, the immediate foreground in the window being used to display smaller items. Brass goods are stocked in drawers, the drawers being sampled and in this way gain display value.

happenings of the town or pictures running at the local theatres. When the writer was in Kingston, one of the latest pictures of Charlie Chaplin, the popular moving picture comedian, called "Sunnyside," was being shown at one of the theatres. A rake was termed "a fine-tooth-comb," a lawn-mower carried a card about "clippings from the Sunnyside barber shop," and in this way, novelty, which is sometimes found of value, was injected into the showing of these goods.

Changed Regularly

The windows are changed at least once a week and occasionally when a special class of goods is featured for the Saturday specials ads., the windows will undergo another transformation to emphasize in their way the importance of the merchandise being offered.

Issue 32-Page Catalogue

One of the biggest sales developing features which the firm has is the yearly mail-order catalogue they issue. The last issue, just off the press, is a 32-page catalogue, which is sent out to a mailing list of 13,500 people. In the catalogue, particular attention is given to the listing of household supplies such as stoves, tinware, enamelware, dairy supplies, refrigerators, pneumatic water supply systems for country homes, pumps, washing machines, etc.

Splendid Results

"The results obtained are really remarkable," stated Mr. Home. "Not only is this noticeable in the increasing mail-order business which we can call a direct result, but with the greatly-increased use of the automobile. Our stove sales directly to former mail-order customers only have shown a tremendous spurt. People whom we would rarely, if ever, see enter our doors are now consistent visitors. The business we are getting is traceable to the good impression created by the catalogue with the convenience afforded by the automobile, which lessens distance materially."

Farmers Better Buyers

Asked as to the class of goods the farmer is demanding, both Mr. Home and Mr. Druce stated there was a call for merchandise which would minimize farm work in the home. "This is slow in come but it is coming," stated Mr. Druce. "We can see it in the plumbing department, in the call for power washing machines and power churns. We are also selling quite a few electric lighting plants, which is a class of business that opens up great opportunities. In the next few years there will be great development along these lines and the field presents almost unlimited possibilities."

Newspaper Advertising

Speaking of newspaper advertising brings one's attention to this carefully planned part of the sales programme of this aggressive firm.

In commenting on the question of newspaper advertising and its value, Mr. Druce brought out a point which is very often overlooked. That is the buying power of the newspaper as a company and meeting the individual employees' requirements. "We find that we are getting a tremendous amount of business just now from the papers themselves and their employees," Mr. Druce pointed out. "We have been called upon to do a great deal of work around the printing plants, and we know many employees who buy from us through our advertising, and who influence their neighbors to do likewise. If we were getting no more business than that generated from these sources as a result of the space we are using, we would feel well repaid. But of course the effect of our advertising is shown also in the increased business from the city and surrounding country served by these papers."

Ever-Increasing Territory

Very often the merchant takes the attitude that he is getting all the business there is in his district—that the territory is limited and possibilities for expansion nil. It is a mistaken idea which merchants in neighboring towns are cashing in on. Speaking on this question of restricted territory and limited opportunities for trade, Mr. Home said: "We are never satisfied to stand still and rest on the laurels of the past. To-day is here and the possibilities for trade are greater than ever before. Unless we are showing constant increase we feel there must be something wrong and the territory we serve is constantly widening. We do intensive work on the immediate territory which we serve, and it is not difficult to increase the scope of our activities all the time. A territory is never worked out or played out unless the merchant serving the territory is worked out or played out. One cannot sit still in this old world of ours—one goes ahead or goes back. We are in the class with those who want to go ahead and are working toward that end."

Telephone to Customers

Another instance of how aggressive tactics are succeeding for this firm is instanced in the business that is done over the telephone. "We have a regular list of customers served by stage routes whom we call at least once a week on the telephone," Mr. Druce stated to SANITARY ENGINEER. "This work is systematized in such a way that each customer can tell what time we will call and has his list of goods ready to read off to us. They appreciate this attention, too, and the expense of phoning is very small when the business which we secure is taken into consideration, besides the good will engendered."

BOARD OF COMMERCE

Continued from Page 20

clude combinations of workmen or employees.

The board consists of three members, but power is given under the act for a commissioner to sit alone, take evidence and submit same for the consideration of the whole board. It does not follow that because a person is invited or subpoenaed to appear before the board that any charges have or will be made against him, the sole object of the board being to obtain information through these witnesses.

The Fair Prices Act

The Fair Prices Act deals with necessaries of life. The term "necessaries of life" is declared to mean a staple and ordinary article of food (whether fresh, preserved, canned or otherwise treated), clothing and fuel, including the products, material, and ingredients from or of which any thereof are in whole or in part manufactured, composed, derived or made, and such other articles of any description as the board may from time to time by special regulation prescribe. The important and outstanding feature of the act is its creation of new statutory offences for the punishing of hoarding and excessive profits. It is declared that no person shall accumulate or shall withhold beyond an amount thereof reasonably required for the use or consumption of his household or for the ordinary purposes of his business. It is directed that every person who shall at any time hold any necessary of life beyond an amount thereof reasonably required for the use or consumption of his household or for the ordinary purposes of his business and every person who shall hold for the purpose of sale, whether as manufacturer, wholesaler, jobber, retailer or otherwise, any stock-in-trade of any necessary of life shall offer for sale the said excess amount, or the said stock in hand, as the case may be, at prices not higher than are reasonable and just.

Farmers Exempted

The exceptions from this general rule against excessive accumulation are: It does not apply to accumulation by a farmer or gardener of farm or garden products of any land cultivated by him. 2. No manufacturer, wholesaler or jobber is, because of anything in the act, obliged to sell to other than such classes of persons as are accustomed to purchase from manufacturers, wholesalers or jobbers, nor shall any person be under obligation to sell otherwise than in accordance with the ordinary course of business.

What Constitutes An Unfair Profit?

On the subject of unfair profits, the act makes an important definition. An unfair profit shall be deemed to have been made when, pursuant to and after the exercise of its powers by this act conferred, the board shall declare an unfair profit to have been made. The unfair enhancement of cost or price shall be such enhancement as has resulted from the making of an unfair profit.

The board is empowered and directed to enquire into and to restrain and prohibit the making or taking of unfair profits for or upon the holding or disposition of necessaries of life, and to restrain and prohibit all such practices

Continued on page 25

Saving Fuel in Heating a House

By L. P. BRECKENRIDGE and S. B. FLAGG

THE total output of coal in the world during the calendar year 1913, according to a Government report, was 1,443,393,052 short tons and of this enormous amount 39.5 per cent., or 570,048,125 tons, was mined in the United States. Probably 10 to 15 per cent. of the coal produced in this country went to purchasers who used it largely for heating dwellings. The Federal Government uses a large quantity of coal for heating the many small buildings occupied by its various departments and bureaus, and is therefore directly interested not only in selecting proper fuels, but in obtaining the best possible results from their consumption. Because of this interest on its own account and the widespread interest of householders the Government some years ago conducted tests to determine the relative value, for use in residence-heating boilers, of several typical fuels.†

The value a householder gets from the fuel he burns depends largely on the character of the heating apparatus, the conditions under which it is installed, and the manner in which the fire is handled. The authors, from experience in firing residence-heating apparatus and from observing the methods employed by many who attend to such apparatus, keenly appreciate the importance of proper firing methods, and have written this paper in the belief that some general remarks on the selection, care and operation of residence-heating apparatus may prove of value to many who are interested in burning fuel in the most economical manner.

This is the fourth instalment of the fourth of the series of Engineering Bulletins issued by the United States Fuel Administration in collaboration with the Bureau of Mines, Department of the Interior. This series is receiving very favorable comment. In this concluding instalment on "Saving Fuel in Heating a House," "General Suggestions on the Firing of Coal, etc.," are dealt with. This fourth article covers the saving of fuel in house heating thoroughly and should appeal to every heating engineer. This is the last instalment. Keep them all for reference.—EDITOR'S NOTE.

Tests and General Deductions

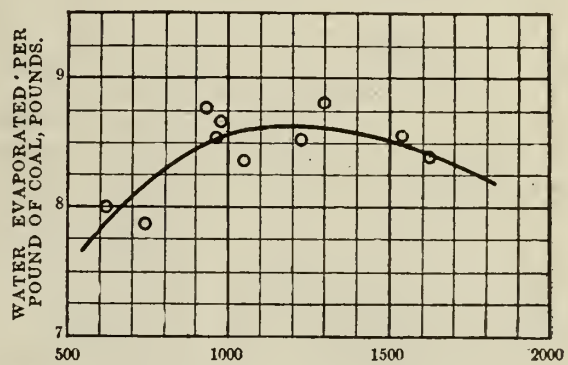
It would be highly desirable to present results of tests that would show a householder how much fuel his own heating equipment, if properly handled, would burn or, if he were considering the installation of such equipment, just what fuel consumption might be expected with any given equipment and fuel. Such information would be appreciated not only by the householder but by architects, heating contractors, and manufacturers of heating equipment.

However, so many variables affect the consumption of fuel in heating equipment that it is impossible to tell closely what quantity of fuel will be needed. A comparison of the amount of fuel burned in heating an equal number of rooms in two houses may be as misleading as a comparison of the ice used by two families, one of which uses much ice for the table and has a refrigerator exposed to excessive heat in a kitchen or on a porch, whereas the other uses little ice on the table and keeps its refrigerator in the cellar.

In fact it would be difficult to construct and equip two houses in such a way that the same quantity of fuel would be required to maintain the same temperature conditions in both, and it would be difficult to buy fuel of such quality that the same quantity would be required for each house if all other conditions were exactly comparable.

Within the last few years some of the leading manufacturers of house-heating boilers have adopted the policy of testing every type of boiler they manufacture and are now publishing, or furnishing on application, the characteristic "economic-performance curves" for each of their boilers when burning different kinds of coal at all probable rates of combustion.

From these performance curves the architect and engineer can plan to better advantage heating equipment for small residences, apartment houses, and office buildings. One of these "economic-performance curves" is shown in figure 3.



Of the published tests of house-heating equipment the greater number were conducted for the purpose of comparing the merits of different fuels for use in such equipment. Tests of this character were made at the Government fuel-testing plant at St. Louis*, at the engineering experiment station of the University of Illinois†, and at the engineering experiment station of the Iowa State College of Agriculture and Mechanical Arts‡, but in none of these tests were residence-heating conditions actually maintained. Therefore the results, although valuable as indicating the behavior of the coals and their probable evaporative power in certain types of boilers at low but fairly uniform rates of combustion, are not of great assistance in determining how much fuel would be needed to heat a certain house.

Data on Fuel Consumption at Residence in New Haven, Conn.

The authors are indebted to Prof. E. H. Lockwood, of the Sheffield Scientific School, Yale University, for the following carefully kept record of the fuel consumed in heating his own residence during the heating season of 1912-13. The record is presented just as received, except for the omission of certain names. It is regrettable that

*Randall, D. T., Tests of coal and briquets as fuel for house-heating boilers: Bull. 27, Bureau of Mines, 44 pp., reprint of U.S. Geol. Survey Bull. 383.

†Snodgrass, J. M., Fuel tests with house-heating boilers: University of Illinois Eng. Exp. Station Bull. 31, 1909, 108 pp.

‡Meeker, W. H., and Wagner, H. W., House-heating fuel tests: Eng. Exp. Station, Iowa State College, Bull. 33, 1913, 85 pp.

other and equally complete records of fuel consumption for heating small residences are not available:

Memorandum of fuel consumed in heating a small residence.
(Reported by E. H. Lockwood.)

LOCATION AND EXPOSURE

1. Location of house.....New Haven, Conn.
2. Street .....52 Division Street.
3. Exposure .....North and east, sheltered by trees; west, protected by a house 20 feet distant.

DESCRIPTION OF HOUSE

4. Construction .....Frame, clapboard on first floor, shingle on second floor, slate roof.
5. Number of stories.....2, plus attic and cellar.
6. Number of rooms heated by heating system. 10.
7. Windows .....Good condition, single glass windows, with storm windows on north side.

DIMENSION OF ROOMS AND RADIATION INSTALLED

	Floor.	Room.	Floor Space in Feet.	Volume in Cubic Ft.	Amount of Hot Water Radiation Installed, in Feet.
8.	First	Parlor	13 by 14	1,300	52
9.	Do.	Dining	14 by 16	2,030	61
10.	Do.	Living	16 by 20	2,800	150
11.	First and second.	Hall	8 by 10	1,200	65
12.	Second	Bedroom	12 by 14	1,320	31
13.	Do.	do.	13 by 14	1,450	35
14.	Do.	do.	11 by 11	980	22
15.	Do.	do.	9 by 11	700	26
16.	Do.	Bathroom	6 by 8	400	13
17.	Attic	Bedroom	10 by 12	850	26

FURNACE AND HEATING SYSTEM

18. Heating system .....Hot water, direct radiation.
19. Kind of heater.....——, hot water, size ——, No. 2.
20. Diameter of fire pot.....20 inches.
21. Area of grate surface.....2.2 square feet.
22. Kind of radiators.....Cast iron, —— make, some 19 in. high, some 33 in. high.
Total amount of hot-water radiation.....481 feet, actual.
23. a. Exposed double-glass surface.....130 square feet.
b. Exposed single-glass surface.....286 square feet.
c. Exposed wall (plaster and clapboard)...1,750 square feet.
d. Total volume of space heated.....13,000 cubic feet.
24. Supplementary heating system.....2 fireplaces, 1 in dining-room, 1 in living room.
25. Wood burned in fireplaces.....1 cord a year.
26. Kind of wood.....Oak and maple, 2-foot lengths.
27. Use of fireplaces.....Dining-room fireplace used nearly every morning in cold weather for about 1 hour; other fireplace used less, more for cheerfulness than for heating.

FUEL AND METHOD OF FIRING

28. Kind of fuel used.....Yard pea (intermediate in size between washed pea and No. 1 buckwheat).
29. Cost of coal, delivered in bins.....$4.25 per short ton (2,000 pounds).
30. Name of dealer.....———— Coal Co., New Haven, Conn.
31. In charge of furnace.....Owner, aided by family.
32. Firing schedule in cold weather.....Coal fired at 7.30 a.m., 8.30 a.m., 1 p.m., 6.30 p.m. and 10 p.m.
33. Automatic appliances .....Clock to open pipe damper at 5.30 a.m. Used every night.

TIME FURNACE WAS OPERATED—1912-13

34. Furnace fire started in fall.....October 2, 1912.
35. Furnace fire ended in spring (not going continuously after May 1).....May 22, 1913.
36. Number of days furnace was in operation..219.
37. Number of weeks furnace was in operation. 31.3.
38. Number of months furnace was in operation. 7.3.

AMOUNT OF COAL BURNED, AND COST

39. Total weight of coal burned during season..18,780 pounds.
40. Total weight of coal burned during season..9.4 net tons.
41. Average weight of coal burned per day.....86 pounds.
42. Greatest weight of coal burned per day (for 2 days only, Jan. 13 and Feb. 6) .....160 pounds.
43. Smallest weight of coal burned per day....20 pounds.
44. Maximum coal burned per week (Feb 7-13).960 pounds.
45. Minimum coal burned per week (Apr. 23-30).160 pounds.
46. Average weight of coal burned per sq. foot of grate per hour on coldest day.....5 pounds.
47. Cost of coal for furnace for season.....$40.
48. Cost of wood for fireplaces for season.....$8.
49. Total yearly cost of heating house, including furnace and fireplaces.....$48.

TEMPERATURES AND CALCULATED RESULTS

50. Average daily temperature inside for whole season, assumed .....69° F.
51. Average daily temperature inside during coldest week, assumed.....66° F.
52. Average daily temperature outside for 219 days, Oct. 2, 1912, to May 22, 1913, from records of New Haven Weather Bureau..41.5° F.
53. Same for coldest week of winter, February 7-13, 1913 .....20.7° F.
54. Constants used for obtaining heat loss from house:
a. Double glass, per sq. ft. per hour.....0.46 B.t.u.
b. Single glass, per sq. ft. per hour.....1.03 B.t.u.
c. Walls (plaster and clapboard).....0.44 B.t.u.
55. Calorific value of coal was not determined, but from analysis of washed pea sold in New Haven, it was estimated at.....12,500 B.t.u.
56. Heat loss from house, figured from items 23, 50, 51, 52, 53, 54, average from Oct. 2, 1912, to May 22, 1913, per hour.....31,000 B.t.u.
57. Same, average during coldest week from Feb. 7-13 ,1913, per hour.....50,800 B.t.u.
58. Heat theoretically available in fuel, figured from items 41, 44, 55 (assuming 1 cord of wood equal to ½ ton of coal):
a. Average from Oct. 2 to May 22, per hr..47,500 B.t.u.
b. Average during coldest week, Feb. 7-13, 1913, per hour.....75,800 B.t.u.
59. Average furnace efficiency, figured from items 56, 57, 58a, 58b:
a. For 219 days, Oct. 2, 1912, to May 22, 1913 .....65 per cent.
b. For coldest week, Feb. 7-13, 1913.....67 per cent.

MISCELLANEOUS REMARKS

Number of years same furnace has been used with this fuel by present owner....Five years.
Experience of owner.....All rooms can be kept comfortable (70° F.) in coldest weather, except 2 rooms (items 8 and 12). These rooms have insufficient radiation and can not be heated above about 65° F. in coldest weather.
63. Use of rooms.....All rooms in the house have been used continuously and heated during entire winter.
64. Capacity of heater.....Has been ample to supply hot water at all times.
65. Method of weighing coal..... A 25-lb. spring balance was hung from bracket on side of coal bin. Coal was shoveled into ordinary scuttle holding 20 lbs. net, and after weighing was dumped into supply box holding 40 lbs.

The report shows not only a low cost of heating but also an economical use of fuel and illustrates what savings may be effected when the problem is given proper consideration. Yard pea could be used because the heater was large enough to burn the coal, even in the coldest weather, at a low rate of combustion per square foot of grate area. Systematic and regular handling of the fire doubtless had considerable to do with the results obtained. The cost of heating is probably $50 to $100 less than what is expended by a large number of householders who live in the same locality and have about the same heating requirements but use more expensive fuel and give their heating equipment less attention.

Summary

The most important points mentioned in this paper are as follows:

1. The amount of fuel consumed in heating a house depends on many factors. Some of the factors are within the control of the householder; others are not.

2. Both convenience of operation and consumption of fuel depend on the system of heating (and ventilation) installed, and convenience, fuel consumption, and first cost should be considered in making a selection.

3. The heater should be large enough to meet continuously and without attention for periods of eight hours the demands for heat in all weather except the most severe.

4. Heating equipment that burns satisfactorily and economically one kind or size of fuel may not be well adapted to burning another.

5. Ascertain by experiment what fuel and what method

of using it are best suited to your needs. As a rule, the effort to obtain this information will be amply rewarded by the saving that will result.

6. Attend to the fire regularly and try to anticipate the demands for heat.

7. Keep the heat-absorbing surfaces of the heater free from soot and dust by regular cleaning.

8. Heating systems often fail to meet the demand for heat in severe weather because of insufficient draft. To supply additional heat, the heater must be able to burn more coal.

9. The more probable causes of insufficient draft are:

(a) Chimney not high enough, or having its top too near some tall object.

(b) Chimney, smoke pipe, or gas passages of heater clogged with soot or debris, sometimes through the breaking of a partition between two flues in a chimney.

(c) Leaky connection of smoke pipe to heater or to chimney.

(d) Accidental closing of hand damper in smoke pipe.

(e) Clogging of fuel by clinkers.

(f) Too great a length of horizontal smoke pipe between the heater and the chimney.

Col. George Nasmith to Engage in Sanitation Consulting Work

COL. GEORGE G. NASMITH, C. M. G., who has been director of the Toronto civic laboratories since the Health Department was reorganized in 1910, will relinquish his duties in that department at the end of the year, and will engage in consulting work on sanitation matters. He plans to enter upon a commercial career, and has accepted an appointment as consulting scientist with the firm of Gore, Storrie & Nasmith, of Toronto. The announcement came as a surprise to the civic authorities, although it could not be said that it was altogether unexpected in the Health Department.

During his association with the Health Department, Dr. Nasmith successfully inaugurated many improvements for the benefit of the citizens, not the least being the regulations for improving the water supply, which resulted in Toronto having the purest water of any city on the continent. He also brought about reforms in regard to milk supply and the supervision of dairies.

At the outbreak of the war, the services of Dr. Nasmith were requisitioned by General Sir Sam Hughes, then Minister of Militia, and he supervised the installation of the water supply and the sanitation at Valcartier camp. He afterwards proceeded to England with the Canadian forces and did valuable work at Salisbury Plains and other points. His greatest work, however, was in France and Flanders. He was present at the second battle of Ypres, when the Germans made their first gas attack. Dr. Nasmith detected the devilish manoeuvre and promptly found an antidote for it. He also invented a gas mask for the use of the troops when combatting similar attacks later. For this and other most valuable scientific work, Dr. Nasmith was honored by His Majesty King George, who conferred upon him the Order of St. Michael and St. George. Dr. Nasmith is an author of some repute, and has just completed for publication a historical review of the earlier stages of the war, under the caption, "Canada's Sons in Great Britain in the World's War."

Since his return from overseas he has written examinations resulting in his adding to his name, the letters D. P. H. (Diploma Public Health).

Want Wells Exempted From Income Taxes

At the annual meeting of the Canadian Natural Gas and Petroleum Association, held at Hamilton, Ont., President C. E. Steele, Port Colborne, pointed out the need of greater co-operation amongst the producers. This, he said, would not only work to their own benefit, but to the benefit of the consumers as well.

The committee on law and legislation recommended that legislation be sought exempting natural gas wells from income taxes and that amendments to the Act permitting the registration of wells on a different basis, be gone after. An effort will also be made to have the duty on natural gas well tools removed.

The association had a membership of 106, and a cash balance of $455, the treasurer reported.

A. M. McQueen referred to the fact that it was a Hamilton man, J. H. Williams, who drilled the first oil well on the continent, at Oil Springs. He expressed the opinion that there were vast oil deposits in Western Ontario. Addresses were delivered by J. P. Mickle, Toronto, and J. Stoliker, Chatham. At the banquet the principal speaker was D. A. Costie, Niagara Falls, who gave an interesting talk on the history of natural gas development.

Board of Health Wants Wider Powers

New legislation designed to give the health department more control over conditions in Winnipeg, is to be considered shortly by the legislation committee. The authorities intend to deal with several recommendations made by Dr. A. J. Douglas, city health officer, in his annual report and prepare the applications for presentation at the next session of the legislature.

The city probably will ask for authority to pass regulations to prevent excessive noise nuisances, and to secure better control over the ventilation of churches, schools, theatres, motion picture theatres, public buildings, factories and workshops.

It intends also to secure for the department power to approve all mechanical systems of ventilation. It hopes to obtain power to regulate undertakers' establishments, to inspect and regulate barber shops, to order the extermination of rats in buildings and their exclusion by better methods of building construction.

The city will ask for power to license and regulate boarding houses and demand the cleanliness, ventilation and heating of street cars and terminals, according to present plans.

DISCOVERY OF OIL IN ENGLAND

J. E. Ray, Canadian Trade Commissioner in Manchester, England, writes as follows:

"With regard to the discovery of oil in England recently, the well-known geologist, Dr. W. Forbes Leslie, who has just completed a tour of inspection of the East Anglian oil fields, states that it is the greatest discovery since coal. It is calculated that over 2,000,000,000 tons of shale lie in the neighborhood of King's Lynn. Supplies are forthcoming in satisfactory quantities, but boring and laying of plant are not yet completed.

"Dr. Leslie states: 'It is my belief that the supply is well nigh inexhaustible, and it is not damaged by sulphur. The oil is wonderfully pure, and the richness of the deposits extraordinary. For every ton of shale we can average 50 gallons or so of pure crude oil.'"

BOARD OF COMMERCE

Continued from Page 22

with respect to the holding or disposition of necessaries of life, as in the opinion of the board are designed or calculated to unfairly enhance the cost or price of such necessaries of life.

Whenever an offence has been committed against the fair prices part of the act, the board may remit the evidence to the attorney-general for such action as he may be pleased to institute. But the act also provides that the board may itself declare or find as to the guilt of the person concerned, and it may order or prohibit the doing or omission of any act or practice relevant to or connected with the offence and in case of disobedience by such person of such order he shall be liable to a penalty not exceeding one thousand dollars and costs for every day after the expiration of four days during which such person continues to disobey or to omit to perform such order.

EDITORIAL COMMENT

EDITORIAL BRIEFS

THIS much seems certain, the longer it takes the world to settle down the longer it is going to take for it to settle up.

* * *

SUCCESSFUL advertising is frequently the result of knowing what should remain unsaid. Don't try to say too much. Get at the points that are essential and that will arouse interest.

* * *

THE rapidity with which the Belgians have got on their feet again suggests that they did not sit down and haggle about how many hours a day they should work.

* * *

THE best goods bring the best profit to both buyer and seller. Thousands of merchants and customers are realizing this now as never before.

* * *

BUYING for cash and selling for cash makes for better business all round.

* * *

A SATISFIED customer always talks, and in ninety-nine cases out of a hundred brings another.

RE-TRAINING THE SOLDIERS

CRITICS have said that the Canadian system of vocational training for returned soldiers might be broader and touch a larger proportion of the men. At present some 12,000 veterans are taking the course. It must be remembered that there is no compulsion in this matter. Only those who apply voluntarily receive the advantages.

Great numbers of the returned men are efficient artisans. Others are good office men or experienced in salesmanship. Some belong to the liberal professions. A goodly proportion of the healthy veterans enter civil life by their own exertions and are "making good." There is a proportion of "drifters" also who perhaps do not realize the advantages of the special training courses offered.

Taking all these facts in to consideration, and remembering that many veterans do not apply until they have had a few months' rest, or until the advantages gained by friends may give personal knowledge of the scope and the value of the training, the roster of 12,000 is large.

The best proof of this assertion is found in a comparison with the situation in Great Britain. There about 4,000,000 were enlisted, eight times as many as were in the Canadian Expeditionary Force. If the same proportion of applications were made in England as in Canada, there would be over 90,000 men under training. The actual number of veterans taking the English courses is only 15,000.

Much of the criticism of the work in Canada has been unsoundly based. Generally speaking, the Dominion has a better organized and more efficient plan of re-education than any other nation engaged in the war. It is supported by the proceeds of the Victory Loan. Every Canadian who buys Victory Bonds may be assured, whatever his political opinions, that the work of re-establishment is a pressing need, and that it will be of the utmost advantage in the complete repatriation of returned men.

COURTESY IN BUSINESS

DON'T regard the traveller as an intruder. Modern commercial conditions have made him almost as important a factor in the business world as the retailer. His business is honorable and he has a legitimate claim on your time and is entitled to be received courteously. If you do not have time to talk to him just when he calls tell him so and tell him in such a way that he cannot help seeing that you would gladly talk to him if you could. Make an arrangement to see him later. If he has a new line, listen to him for there may be some good profit in it for you. If he has goods that you do not need you can tell him so courteously.

MAY CLEAR THE AIR

TWO of the greatest strikes in history are now in progress. The walk-out in England involves more than half a million railway workers. That in the United States more than 250,000 workers in the big steel mills. At the present time it is impossible to even forecast what is likely to happen as not enough time has elapsed for developments of a real character in such titanic tests of strength. One thing seems to be fairly certain that no matter which side wins the air will be cleared and an enormous amount of the unrest that has prevailed will be dispelled. This will, of course, mean a step toward normal business conditions, and that is something which every business man has desired earnestly. The effects of the strikes on trade are already

making themselves apparent in slowness of deliveries and a tendency for the markets to stiffen as supplies which are sold out cannot be immediately replaced. Neither do the dealers expect to replace them at former quotations. The general business situation in Canada is regarded as most excellent and the prospects are that it will continue so.

GREAT BUILDING ACTIVITY

EVERY week sees increased activity in the building trades. Many contractors have more work now in hand than they had just before the war and that was the busiest period for many of them in their history. The building projects include all kinds of work, but from the standpoint of the plumber it is particularly gratifying to see so many splendid homes being constructed. Houses of the better class are being erected in great numbers. These call for the best in many lines supplied by the plumbers and a splendid business is being done. In spite of all the work that is now under way a still larger programme of building is developing for next season, and indications are that 1920 will mark new records in construction work in Canada. Many firms are finding themselves so rushed with business that extensions to their plants are required to take care of orders. A large amount of construction work of this kind is developing.

HOUSEHOLDERS AND ELECTRICITY

ON every side the rapid development of electrical utilities is witnessed. Electric washing machines, motors for sewing machines, electric vacuum cleaners—one can go on naming them and one striking thing is the attention paid to the householder, to the lady of the house. Evidence is not lacking that efforts are being put forth to give to the housewife equipment which will make her work easier and better. The shortage of domestic help is one big factor upon which the merchant can depend to enlarge upon his sales of these various appliances. Even when domestic help is available, greater consideration is given towards lightening their labors and the woman of the house is quick to see the advantages in modern electrical equipment. Developing this trade is profitable and makes friends who become permanent customers of the store. Many plumbers to-day are realizing this fact and planning their sales campaigns accordingly.

POOR TELEPHONE SERVICE

POOR telephone service, especially after being promised better service after the rates were raised by the company, is annoying. Business men have been complaining bitterly about long delays in getting calls through, being given wrong numbers repeatedly and similar annoyances. As far as Toronto goes there is apparently some justification for the complaints. It is extremely annoying for anyone who wants a number in a hurry to wait anywhere from three to five minutes before the 'phone is answered, and then to be given a wrong number. When he gets wrong numbers three or four times, with the usual delays in getting an answer at all, the party who is trying to 'phone is exasperated. It is just as annoying after one has given a number and waited some minutes without results to be asked by some sweet-voiced young thing: "Were you wanting a number?" and yet this sort of thing is happening dozens of times every day. If the statements of business men are even anywhere near correct there is ample room for improvement in the telephone service.

HELP THIS GOOD WORK

THE Canadian Government, by proclamation, has designated Thursday, October 9, as "Fire Prevention Day," and people all over the Dominion are being asked to make a close investigation of their premises with a view to discovering and removing all possible causes of fires. Business men are vitally interested in this matter not only personally but from a community standpoint. Many firms realized long ago the dangers that lie in piles of rubbish in cellars and back yards or other places. Their neighbors do not always take the same view and a little personal talk on this question may be the means of saving thousands of dollars from the fire demon. Statistics prove that Canada's enormous fire losses are due not to the fires that originate in the homes but to the destruction of stores and factories. Every time a large store goes up in smoke the loss runs anywhere up to a million dollars. If a home burns the loss seldom exceeds $5,000. The great quantities of goods that are destroyed every time a store or a factory burns means an absolute loss. They cannot be replaced. Due to fires of this kind and to forest fires, Canada's per capita loss has grown to be the largest in the world. The great majority of the costly fires are traceable to carelessness. It is to bring home to people the seriousness of the situation and to impress them with the need of being careful that the Government has instituted "Fire Prevention Day." October 9 was chosen because it was the anniversary of the great fire in Chicago which started when a cow kicked over a lantern in a barn. Every business man can do something to lessen the fire loss in Canada, and it is his duty to do it and lend all the support he can to a movement that will make things better for the entire Dominion. Another matter in which the merchants can help is in seeing that the building by-laws in their community are so altered that fire dangers will be reduced to a minimum. In many towns and cities the building by-laws are obsolete. In others there are good regulations but they are not lived up to. Every effort should be made to see that situations of this kind are corrected.

News from Here and There

CONTRIBUTIONS OF NEWS GLADLY ACCEPTED

PERSONALS

Sometime ago it was announced that Paul Mercier, chief engineer of the city of Montreal, was resigning from the position. It is now learned that he will not be entirely dissociated from the affairs of the city, as he has been retained in the employ of the ratepayers as a consulting engineer. His time, however, will only be partly occupied in this connection, as he will join the staff of the Ecole Polytechnique as an instructor and lecturer.

After serving for four years overseas with infantry battalions and the Engineers, Paul Whitney, of Toronto, has returned and has been appointed manager of the B. Blair Tile Manufacturing Company, Ltd., of Woodstock, Ont. Mr. Whitney was formerly a resident of Prescott, Ont.

NEW FIRMS

A. P. Johnston and J. J. Richardson, hardware and plumbing, have commenced business at Walkerton, Ont., under the firm name of Johnston & Richardson.

TRADE NOTES

H. B. Wilcox, Toronto, plumbing and hardware, has discontinued business.

The Taylor Forbes Co., Ltd., of Guelph, Ont., is erecting an addition to its foundry to cost $9,000.

The Renfrew Electric Products, Ltd., has purchased the Majestic Electric Supplies, Ltd., of Toronto, Ont. The headquarters of the firm will be at 29 Richmond Street W., Toronto.

WANTS PURER WATER

Dr. James Roberts, M. O. H., of Hamilton, Ont., will shortly ask the city to provide additional sanitary equipment for filtering city water. The present equipment, Dr. Roberts states, was doing good work, but when a high east wind is blowing, the city water becomes contaminated, and this is a condition which the health department is trying to overcome.

He is not satisfied with the present conditions, despite the fact that they compare favorably with other large cities. A small expenditure would overcome the polluted condition when east winds are blowing, and he is of the opinion that on no occasion should Hamiltonians have to use water which does not meet with the health requirements. He pointed out that contaminated water used for one day would be sufficient to cause an epidemic, and will recommend that the new apparatus be installed.

Sudden Death of W. Cromwell Gurney

Prominent Toronto Business Man—President and General Manager Gurney Foundry Co., Ltd.

W. Cromwell Gurney, president and general manager of the Gurney Foundry Co., Ltd., collapsed suddenly while visiting the office of his physician for routine treatment. In spite of the efforts of two other physicians present, resuscitation was impossible, and Mr. Gurney passed away from heart failure.

Earlier in the year Mr. Gurney suffered from influenza, from which he had not made a complete recovery. The sudden death of his mother only last week affected him profoundly, and since that tragic event he had been upset and unlike himself. The news of his death came with shocking suddenness, as he

The late W. C. GURNEY

lunched yesterday, apparently in good health, at the National Club in company with business associates.

Mr. Gurney, who was in his 46th year, was the son of the late Edward Gurney, whom he succeeded as president of the firm upon the latter's death a few years ago. He was educated at Upper Canada College, and then entered the Gurney Foundry Co. He was a member of the National Club, Lambton Golf Club, the Canadian Manufacturers' Association, the Board of Trade, and was one of the best-known of Toronto's business men. He was also a member of the Metropolitan Church.

He is survived by his wife and three children, and also one brother, E. H. Gurney, and three sisters, Mrs. Sanford Evans, Ottawa; Mrs. E. B. Ryckman, Toronto, and Miss Gladys Gurney.

Plumbing Inspector Appointed At London

The City Council of London, Ont., after a long delay, has appointed James C. Young of London, as plumbing inspector. The salary is to be $1,500 per annum. It will be his duty to see that all existing bylaws in regard to plumbing are enforced. In future a permit must be taken out by anyone before fixtures relating to plumbing may be installed, and on completion the work must undergo an inspection, for which a charge will be made of $1 for up to five fixtures, and an additional charge of 25 cents for each one above that number.

All the bylaws in regard to buildings must be referred to the plumbing inspector and a report will be made by him to the board of health, relating to the plan for plumbing arrangements.

A journeyman plumber must be in possession of a license from now on.

W. H. CUNNINGHAM BACK

W. H. Cunningham of W. H. Cunningham & Co., Toronto, who has been spending a few weeks in England and Scotland, on business, returned on the "Tunisian." Mr. Cunningham reports great difficulty in securing return passage. Many of his fellow passengers have been weeks trying to book.

Maulson & Buchanan, 40 King St. E., Toronto, have secured the agency for Canada for the line of sanitary clay products and sanitary fixtures manufactured by George Howson & Son, of Hanby, England.

L. J. MUELLER FURNACE CO.

"The Modern Method of Heating Your Home," issued by the L. J. Mueller Furnace Co., of Milwaukee, Wisconsin, contains sixteen pages and deals thoroughly with the Mueller pipeless furnace. The catalogue is printed on glazed paper and is very attractively illustrated. Readers of SANITARY ENGINEER may obtain copies upon request.

Hamilton Master Plumbers Entertained by Standard Sanitary Mfg. Co., Limited

ABOUT eighty of the Master Plumbers of Hamilton, Ont., together with members of the craft from Toronto, Bridgeburg, Niagara Falls, Brantford and Galt, were guests of the Standard Sanitary Mfg. Co., Limited, Toronto, this week, at a banquet held in the King Edward Hotel, and a trip of inspection through the firm's factory.

The outing was arranged by Charles F. Rogers, manager of the company's Hamilton branch, and with the idea of not only bringing the men in the trade together, but of showing them how the goods they are installing are manufactured.

Automobiles were provided and the party got an early start from Hamilton. All went well until the party reached Oakville, where a half an hour was lost while the members made a detour around big "Bill" Whittaker. Soon after this, John Kerr of Hamilton, was stopped by D. W. Rose, of the Gurney Foundry Co., for speeding. Mr. Kerr did not know until he reached Toronto, that a joke was being played on him, and he was much relieved to find that he was not to appear in court on the charge.

Enjoyed Fine Banquet

Soon after arriving in Toronto, the members of the party were taken to the King Edward Hotel for dinner. Following an excellent meal, W. H. Cunningham, of W. H. Cunningham & Co., Toronto, who was toastmaster, proposed the toast to the King. After this had been responded to enthusiastically, the chairman called upon Mr. Hugh Wallace, manager of the Standard Sanitary Mfg. Co., Limited.

Mr. Wallace extended to the visitors a very hearty welcome and declared that it gave him real pleasure, as a former resident of Hamilton, to see so many of his old friends. He regarded it as a real reunion. Gathering together by men in the same line of business was beneficial at all times and brought about a better understanding of one another's problems and promoted general good feeling. Years ago, he said, the men in the trade did not know each other as they should and did not work together. To-day men are working along different lines and organization and friendship is taking the place of the former spirit that kept men apart.

Scores Price Cutting

The old plan, he said, encouraged such evils as price cutting and by working selfishly alone men often found that in the end they had been working without profit. Because one man made a certain price on a job, they felt they had to cut under it, and so it went. This was a wrong plan, and men have discovered that they need to work on a broader basis and have been studying the problems in their own trade and trying to work them out for the good of all.

Mr. Wallace expressed regret that the president of the company, Mr. J. A. Riordan, was ill and unable to attend. On his behalf, he welcomed the visitors not only to Toronto, but to an inspection of the factory.

Kindness Appreciated

W. J. Walsh, on behalf of the members of the Sanitary and Heating Association of Hamilton, expressed the thanks of those present to the company for the outing and entertainment.

"Every time the men in our trade or any other get together at an affair of this kind," he said, "good results. There is a bond established between them and a better feeling exists." A trip through the plant would not only educate the men present, regarding the way in which the goods they were handling are manufactured, but it would bring them into touch with the manufacturer and all those working in the same business have a common interest. Getting together creates a spirit of live and let live and the men should endeavor to get together oftener."

James Saynor of Hamilton, spoke briefly in seconding the vote of thanks proposed by Mr. Walsh.

Co-operation Counts

Charles Marks, of the firm of Marks & Co., Hamilton, spoke of the good relations existing in the trade, and stated that nothing could help cement this spirit like meeting at such gatherings.

"In helping one another," he said, "we help ourselves."

T. H. McLaren, of the Galt Brass Co., urged the men in the trade to get together often and work together for the common good.

Charles F. Rogers, manager of the company's Hamilton branch, was given a rousing reception when he rose to speak. He spoke of the good results of co-operation.

"We are all in the same business," he said, "and we ought to get acquainted and be on friendly terms. There is more in business than a mere dollars and cents' relationship. When you get together and help one another work out your common problems you can get real results. Develop the personal side. You can always learn something from the other fellow, and after you get to know him, you will be glad that you have made his acquaintance.

Stayed For Meeting

K. B. Allison, of the Toronto Society of Domestic Heating and Sanitary Engineers, extended an invitation to the visitors to attend the regular meeting of the Toronto Society in the evening. A number of them did so.

During the afternoon the visitors inspected the factory and saw how the goods were made.

Among those who were guests of the company were: Charles Marks, of Marks & Co., Hamilton; J. F. Birchard, of Ward & King, Toronto; T. H. McLaren, of the Galt Brass Co.; D. W. Rose, of the Gurney Foundry Co., Toronto; W. H. Cunningham, of the W. H. Cunningham & Co., Toronto; C. E. Parsons, of Sanitary Engineer; W. F. Wilkinson, of Fort Erie; E. Cardwell, of W. T. Boyd, of Welland; Sam Hanna, of Niagara Falls; George Taylor, of Brantford; C. Montgomery, of Caledonia; K. B. Allison, of Toronto, and the following from Hamilton: T. Allison, W. T. Boyd, A Beare, A. Bonner, J. F. Birchard, W. Blackalake, J. Berwick, H. Barnes, A. J. Byles, G. Calbeck, O. Clayton, A. Crompton, W. Coffee, E. Cardwell, W. H. Cunningham, Jas. Cummings, A. E. Fletcher, H. Grisch, W. Goodram, F. Goodram, R. Haygarth, S. Hanna, Hinmen, J. Hart, F. Jaschke, J. Kerr, J. Luxon, B. Luxon, P. A. Moore, C. Montgomery, A Mitchell, F. Mullens, A. McKenzie, J. McBeth; J. Matthews, Geo. Pyle, F. Quigley, Ernie Read, F. Shepperd, Geo. Stevenson, F. Sheldrick, Percy Smith, James Saynor, Jas. Sinclair, I. Walsh, D. Wark, W. J. Whitlock, J. F. Whithead, C. F. Rogers, A. E. Hunter, H. A. Rogers, W. A. Paterson, J. Allan, W. Tribe, T. Woods, W. J. Walsh, A. Hoople, N. Clark, T. Arthurs, T. D. Kerr, Chas. Smith, L. Gies, C. Marks, C. P. Marks, Wm. Whittaker, jr., D. W. Rose, D. Robinson, L. H. Horning, F. Chapman.

SHEETS AND WIRE PRODUCTS ACTIVE

The "Iron Trade Review," Cleveland, Ohio, says:

A growing gap between incoming mill specifications and production, despite the latter's steady increase, furnishes wholesome symptoms as to fundamental conditions in iron and steel. The result is an accumulating backlog of live tonnage on mill books in a number of lines, which tends to fortify future operations. Average bookings of the Steel Corporation at present are considerably in excess of hsipments and also of capacity, which means something over 50,000 tons daily. This fact promises to be re-flected in the June unfilled order statement to be issued to-day. The point needs to be stressed that this is an extraordinarily good showing for the whole industry considering the absence of railroad demand.

New orders and specifications in sheets are coming in at the rate of over 20,000 tons daily. In wire products, the mills now are booked practically full for the third quarter and some for a larger period. The rush of demand for oil and gas field pipe has fairly swamped makers and some of the latter are being forced to turn away further business. Tin plate output is up to 90 per cent. The idle Columbus, O., works of the Carnegie Steel Co. is being made ready for early production of sheet bars. A number of steel work blast furnaces are about to blow in.

There is more reference to unskilled labor shortage as a factor in production,

Continued on page 34

Heating and Ventilating

THE HEATING OF HOSPITALS

Thirteenth Article of Series Prepared for Readers of "Sanitary Engineer" by N. A. Kearns

Editor's Note.—This article is the thirteenth of a series prepared especially for the readers of SANITARY ENGINEER, covering heating and engineering practice reduced to its simplest terms. Readers will find this article on "The Heating of Hospitals" a most illuminative one. The first article of the series appeared in the April 1 issue. Descriptions of installations made in different classes of buildings will be given, together with the method used in making the design for these installations. It is not our purpose to give complicated formulas, but rather to present the simple rules that have been based on these formulas, in such a way that the reader will be enabled to design a heating and ventilating system without having to refer to the data given in engineers' hand-books. The author of these articles, Mr. N. A. Kearns, has designed heating and ventilating equipment for all classes of buildings in practically every province of the Dominion. Some of the buildings were such that the heating and ventilating equipment had to be installed under the most adverse conditions, whereas in other buildings the design for the heating and ventilating equipment was incorporated in the constructional drawings. The fourteenth article of the series will appear in the next issue.

THE opportunity for the expression of the true worth of a sanitarian is so great when he is entrusted with the installation of the heating and ventilating or sanitary machinery of a hospital building that unless he is a man of most exacting conscience he should not dare avail himself of the privilege of doing the work.

In a building where the sick and the helpless are to be nursed back to health it is indeed a poor type of a man that cannot hear an insistent call to attend to duties that are often left long in the hands of those who have smothered their every altruistic instinct in mercenary interests.

There is, perhaps, nothing in the nature of the sanitarian's work that has received so much criticism and condemnation than the mechanical equipment to be found in many of our older hospitals.

The crime of these faulty installations is so far-reaching in its evil effects that no engineer who has any regard for his reputation or his character would care to be responsible for such.

Engineer to Blame

Still the blame can hardly be placed elsewhere than with the engineer, for although the question of what standards are required for temperature and air conditions in a hospital properly belong to the physiologist, and although those men were often at fault in their conclusions, the broad fact remains that too often the mechanical equipments were not designed nor installed in a way that would result in even an approximation of the standards set.

In this article we intend to treat the subjects of heating, of ventilating and of the sanitary equipment of the hospital in a broad way, only directing the reader's attention to such details as we believe worthy to rank in first importance.

In an article of this length the reader must not expect to find all of the information that he may require when he undertakes the design of plants described, but he will find enough data to give him a fairly comprehensive idea of the value of the different systems generally used in the modern hospital building.

Interesting History

The hospital, in common with all human institutions that have to do with the public health, has had a varied and intensely interesting history. Some of the most vivid passages in literature deal with the development of the hospital from the days when Sairey Gamp was a first-class example of attendant to these days when the nursing profession is one of the most highly honored by a grateful public.

The standard of sanitary equipment in hospital buildings has not, until recent years, kept pace with the wonderful improvement in the personnel of the attendants, nor in the administration of the hospital as an institution. The slow advance of the sanitarian was in a great measure due to his lack of interest in the study of the requirements for his activities in such a building. Thus, when the constructing sanitary engineer was called upon to install a heating and ventilating or a sanitary plant for a hospital building, he often sought for information from the easiest sources available, and that source was generally the consulting engineers employed by manufacturers of the goods that would be naturally specified.

Not Always as Easy

Technical information was not always as easy to gather as it is to-day, and when the sanitarian of the past made the claim that it was better business to confine his personal attention to work where he had an opportunity of exercising his particular abilities every day than it was where, perhaps, only once in a long life would he have the opportunity of using the information that would cost much time and money in gathering, his plea was then in one way justified. But to-day when the results of laboratory and other experiments are published almost as soon as made, and when tabulated data are so easily obtained, it would seem that only one of a very indifferent mental character could neglect the information so easily acquired.

Specifications Overlapped

It was not that engineers employed by manufacturers were any less capable of doing good work than those in independent practice that caused overlapping of specifications and the excess equipment of certain machinery in public buildings. The reason for the excess, say, of kitchen fixtures often could be found in the engineer's desire to play safe and to provide for nothing less than that required. So he made sure that nothing to be supplied by his firm would be neglected, and thus he specified everything from the "Bain Marie" to the ice cream freezer.

Not Many Specialists

It is only a student of capital affairs and a specialist in such work that can

possibly know much more of what is fit and proper for such an institution than can his brother in the craft. There are not a great many hospital specialists in the heating and ventilating walks of life, so no constructing sanitary engineer need think that he is perfectly safe in neglecting this necessary study because he is being directed in his work by a consulting engineer The consulting engineer may be by no means a hospital specialist, and only as a cunning man of formulae and figures does he design his work. Some of the worst examples of hospital equipment are the fault of engineers that were so full of the ego that they could not ask hospital superintendents for information. Those engineers knew all about such things as B.t.u. calories, ergo, dynes, etc., ad infinitum; but when they relied wholly on that knowledge when designing a plant for a hospital, they were in the same category as the steamfitter or plumber that blindly followed the easy paths of precedent.

Really Only Two

Although there are many different types of hospitals, there are really only two of these types that we need take for example in our description of sanitary heating, ventilating and plumbing systems. We will refer to the general hospital and to those used in the isolation of patients in contagious diseases.

As a rule, the contagious disease hospital is not a very large building, and although its heating and plumbing plants require very special attention, the piping used in these buildings is much less complicated than it is in the larger general hospital. So we will therefore take up first the subject of the general hospital, and then the subject of the contagious disease hospital.

The necessity for ventilation and the problems arising from that necessity will be better comprehended after a reading of the other article appearing in this number of SANITARY ENGINEER and dealing more especially with school house ventilation. There is so much, however, peculiar to hospital systems that we cannot now neglect some mention of the particular requirements of hospital ventilating systems.

The Requirements

In the articles referring to school house ventilation it was stated that 30 cubic feet of air per minute, or 1,800 cubic feet of air per hour, should be the standard quantity of air allowed per pupil. Hospitals require a great deal higher standard than this; ordinarily from 2,100 to 5,000 cubic ft. per hour per patient is the rate.

Many systems have been devised for providing pure fresh air in these quantities. If a dilution system is installed 5,000 cubic feet per hour per bed is not too much air, but if a direct flushing system is installed, much less fresh air will be required.

Some hospital attendants claim that the patients thrive better with the natural ventilation obtained by the opening of windows than they do when weather conditions permits only of ventilation being obtained by the mechanical plant. Certainly there are times when open windows give all of the ventilation required, but so far it has not been proven that window ventilation alone provides a satisfactory solution of the problem of properly ventilating hospital wards, or, in fact, the rooms of any building. However, as there is some merit in window ventilation, it is well that the ventilating engineer should make some provision for the advantageous use of this low cost system of ventilation.

Auxiliary Sash

If it is the purpose to ventilate the building by means of the windows, each window, used as a source of fresh air supply, should be fitted with an auxiliary sash covered with unbleached cotton cloth. This sash should be so made that it can be let into the space left by the raising of the lower sash. The cloth area of the sash should be based on about 3 sq. ft. per bed.

The foul air exhaust fans should be set in a wall almost directly opposite to the opened window, and there should be two faces set in every foul-air flue, one face to be at the floor line, and the other about 6 ft. 6 in. from the floor. The foul air flues must be connected to an exhaust fan, for where no exhaust fan is used with such a system there is never a proper movement of air in the wards on the lee-side of the building. On the windward side the rooms will receive far more air than may be required, while those on the other side of the building will more likely than not be subject to an outward leakage of air, instead of the inward flushing action that the advocates of the so-called "natural system of ventilation" believes they obtain by way of the opened window.

Semi-Direct Radiators

In some of the smaller hospitals ventilation is effected by the passage of fresh outdoor air through the special bases of semi-direct radiators into the rooms where the air is required. The vitiated air is removed by way of vent openings and flues, just as with the system of window cloth ventilation.

Either the window cloth system or the system of semi-direct radiators is, especially if used in conjunction with an exhaust fan, far superior to no system of ventilation at all, but as there has been so far no possible means for controlling the volume of the air leaking into or out of the building where such a system is installed, a great many engineers hesitate to risk their reputations with such systems. Force of circumstance sometimes makes necessary the installation of the lowest first-cost system of ventilation. But as low first-cost systems are necessarily so incomplete in detail, they require a great deal of intermitting attention from so many different people around the building, a successful operation cannot be assured. Yet such a system is far superior to the most expensive mechanical plant if the plant is allowed to stand idle.

Sanitation Is Vital

No matter how small a hospital building may be, it is never so small that too much attention can be paid to its sanitary machinery and its details. And when a person understands how great a proportion of the operating expense of a hospital is connected with the heating and power plant, he at once realizes the importance of giving more than a casual consideration to such subjects.

We may take the largest hospital we know of and then turn to the smaller buildings, where, perhaps, the building is not as large as that housing the power plant for the larger institution. Now, in one we may have an engineering staff of highly paid men, and in the other one general caretaker, whose attention to his engineering work is crowded in between other duties.

The Basic Problem

The basic problem, which is that of supplying the patients with air of the proper temperature and the right degree of purity is exactly the same in both of these buildings; but our method of solution must be different where circumstances differ so much. In the small building we could hardly think of installing a power plant, and it might be that we could get along very well with a gravity system of ventilation. Perhaps, also, it might be advisable to install a hot water system of heating in such a building in preference to that of steam. The solution of these questions is more an exercise of common sense than a matter of the adoption of formula.

Some of the details appearing in this article properly belong only to plants in large buildings; but it is altogether likely that the very necessity for their installation may be such that the detail will suggest some way for the reader to adopt it in principle to some smaller installation.

Power and Heating

For the time being we will drop the subject of ventilation and deal with other parts of the heating and power plants, later on coming back to the details of the ventilating part of the system.

Usually it is the custom of architects to show on the floor plans of the wards, the locations for the beds. And it is a very good thing that they do this, because when the heating engineer gets the plan he finds very little room left for his radiators, and if the beds were not shown on the plans it is altogether likely that the architect would find that after the rads were installed there would be little room left for the beds. Very often in public wards, where the heads of the beds are backed up to the outside walls, the radiators are so close to the

Continued on page 33

Ventilating the Modern School

Twelfth Article of Series Written Especially for "Sanitary Engineer" by N. A. Kearns—First Article of Series Appeared in April 1 Issue

In the articles so far appearing in this series we have dwelt almost entirely within the field of the mechanical application of systems that serve to maintain the standards of ventilation fixed by the arbitrary rules of the usual practice of the ventilating engineers.

It is now our purpose to present the theories which are at the root of many of these standards, and in doing so we will try to show why physiologists and heating engineers do not always agree in their opinions regarding the subject of what constitutes an adequate ventilating system.

How It Developed

In most of the printed works that deal with ventilating systems, the subject of air analysis is taken up in the first chapter, but we have left it until we present some of the mechanical details of practical work, so that the reader might better understand how a vocation using the data based often on conflicting theories has developed into the engineering practice of to-day.

To one not prepared for a reception of these theories, by an understanding of how, in the actual work of installing ventilating systems, many of the conflicting opinions are reconciled, many of the statements appearing in this article will be contradictory, and because of this it was not considered wise to present the article as the first of the series.

There is a good deal more to say regarding the mechanical details of ventilating systems than has so far been presented in these articles, but as from now on we must constantly refer to the basis of our standards, the reader, if he wishes to follow these articles further, must now pause long enough to gather some information in connection with the theory, and no longer be satisfied with the practical workings of these systems alone.

Basis of Standard

Now the basis of the standard set by one school of thought is found in the treating of the subject of ventilation as a problem in chemistry. This is the oldest school, and as the usual practice of the ventilating engineer of to-day is built upon the theories of that school, we will look into this subject first from their point of view and then afterwards examine the theories of the school claiming that ventilation is purely a physical problem, and that it has little or nothing in common with the study of chemistry.

Composition of Air

For convenience in referring to the data gathered by the first school we will consider the problem of the chemical composition of air; with special reference to carbon-dioxide, oxygen, nitrogen, and organic matter that is due to exhalation and body excretions.

One pound of pure outdoor air, free of moisture, contains:

	Pounds
Oxygen	.2307
Nitrogen	.7687
Carbon dioxide	.0004

Oxygen is the breath of life. It is the supporting element of the breath, without which the blood could not be nourished. Man can live in pure oxygen alone for an hour or more without any great inconvenience. Oxygen is used frequently pure or mixed with other elements for the cure of certain forms of disease. But as vital a thing as this oxygen is, its very value makes it too strong for an exclusive lung diet. When a person breathes pure oxygen for a certain length of time their energies increase, and keep on increasing at such a rapidly accelerated rate that shortly the body becomes feverish and intoxicated.

Drawn Into Lungs

The nitrogen is drawn into the lungs along with the oxygen, and is exhaled without undergoing any change. The oxygen is taken into the blood and carbon-dioxide is thrown off. Thus, when a person breathes he will take in, say, about 50 cubic inches of air with each breath, the air containing volume when taken in about 79 per cent. of nitrogen, 20 per cent. of oxygen and a small quantity of carbon-dioxide. When the air is exhaled, the carbon dioxide is increased to about 4 per cent. of the volume. This reduces the quantity of oxygen to nearly 26 per cent.

A lack of oxygen spells death to all living flesh, or to fire. If a room were tightly closed, life could not long be sustained in it.

The average adult consumes oxygen at about the rate of 20 cubic feet per day, the consumption varying with the activity of the man.

When air is taken into the lung cells, the oxygen comes into contact with the carbonaceous matter in the blood stream and a new combination takes place resulting in carbon dioxide (CO_2). This process is combustion and differs only in degree of intensity from that taking place in a furnace.

Checks Combustion

If air is breathed that contains a large amount of carbon-dioxide, combustion is checked, and the carbon is not thrown off fast enough from the body, thus congestion in the circulation occurs, followed by headaches and other disorders.

The organic impurities exhaled from the lungs are many and varied. They are varied because the eating and other habits of men are varied. No exact data regarding their chemical composition has as yet been determined, but we know that when they are present in the air, even in moderate quantities, that they cause a feeling of oppression, and when they are concentrated they are extremely dangerous. They have a positively poisonous effect when inhaled.

Definite Proportion

The quantity of organic matter exhaled seems to bear a definite proportion to the carbon-dioxide taken into the lungs, and it is for this reason that the quantity of carbon-dioxide in the air is used for gauging the degree of air pollution. The carbon-dioxide can be readily measured by physiologists that the measure of carbon-dioxide could be used as a measure of the pollution of air due to organic impurities.

Outdoor air contains about four parts of CO_2 in 10,000, and it is generally considered a room is well ventilated that contains not more than 6 to 8 parts of CO_2 in 10,000.

The First Problem

The engineer, when he is given the task of providing a mechanical equipment that will maintain a degree of air purity, measured by the amount of CO_2 in the air, must first ascertain how much CO_2 will be added to the air by the exhalations and the body excretions of the occupants within the building. Then, when he has this fixed he is ready to design a plant that will supply enough fresh air to take the place of the air charged with CO_2.

Offsetting Pollution

In some cases he endeavors to offset the pollution by pouring in enough fresh aid to dilute the air within the building to a point of relative purity, and in other cases he designs the ventilating systems so that the foul air is flushed out of the building by the force of incoming fresh air; the flushing action being in some cases assisted by the pulling power of induced draft in the exhausts.

The air allowed per person per cubic feet an hour, when based on this theory, is given in the following table:

Schools	1,800
Theatre	1,200 to 1,800
Hospitals (ordinary)	2,100 to 2,400
Hospitals (epidemic)	4,800

Hard to Convince

Nearly all high-grade ventilating systems have been installed with their designers' eyes fixed on the standards set by what the new school of ventilating engineers term erroneous theories, but nevertheless, after this new school succeeds in coming to a conclusion as to what is really required, they have difficulty in convincing the great mass of people that there is anything justifying any repugnance to taking air into the lungs that has already been breathed over and over again by others.

These fellows claim that all we need in a ventilating system is to keep the air in motion so that it will carry away the animal heat from the bodies of those within a building.

These men claim that there is no scientific fact proving that air once breathed is unfit for further breathing, and all they believe to be desirable is an ap-

paratus for cleaning the air of dust and organic impurities, and also of bodily odors.

Would Effect Saving

Certainly if they ever succeed in proving their theories, some saving in the cost of ventilating a building may be effected.

In a system of ventilation designed on the principles formulated by this body of men, there would be no foul air exhausts. The air would be brought back to an air-treating chamber where it would be washed clear of organic impurities, and its temperature changed to the degree required. There should also be set in this chamber an apparatus for removing odors from the air.

Missed the Essentials

According to the new school, the older physiologists and ventilating engineers have in their consideration of the problem as one of chemistry, missed the real essence of the subject. This school claims that the very thing taken as an indication of the standard of air purity, viz., the CO_2 is the root of what they are pleased to term "Absurd conclusions."

The claim is made that with air kept in movement and at a proper temperature, no inconvenience was experienced or harmful results noted when the air was charged with CO_2 to the extent of 50 parts in 10,000.

But that is not their only claim. They also say that the oxygen content of an occupied room is not lessened, nor the CO_2 content increased sufficiently to enter into the problem of ventilation.

Defend Position

In turn the older school reply to these men that while they admit that the oxygen and CO_2 content of a room, many have taken up too much of their attention in the past; they know that a slight diminution of oxygen occurring in an occupied apartment has a direct effect on the oxidation within the bodies of the occupants. When breathing an excess of CO_2, even when the air is free from organic impurities, there is a marked decrease in the appetite for food with a corresponding fall in weight.

Still the Standard

In the meantime while the battle between the two schools goes merrily on, we may use CO_2 as a standard of value for indicating the quality of fresh air supply and its diffusion.

Perhaps the man who sits down in his prejudice and refuses to go any further on the road to knowledge is not so lively as his brother, who grabs with glee every new theory that comes his way; but it is certain that he is not so exasperating in the desire to throw away all of the knowledge he has already gathered.

Three men walk along every road of life a little way together. There is the "Theorist," the "Practical Man" and the "Faddist," and the fool of the trio is the "Faddist." He is the man who, with one eye half opened, jumped at the conclusion that, because he sees a thing he has seen it first, and that all other men who are not rushing in his direction are poor old fossils, with no vision and no initiative. He cannot comprehend their desire to see things as they are before becoming their champion, and so he goes floundering through a bog of half-baked ideas after some will-of-the-wisp.

Many progressive men have known the day when they might have been numbered with the faddists. There was an excuse for them because they were young and inexperienced, but there is hardly an excuse for the man of years, of what should be discretion, rushing in where others fear to tread, and in rushing in spend the money that belongs to taxpayers.

May Not Work Out

When any new theory is presented, and the results of experiments are given so as to bolster up the truth of that theory, the investigator may find that there is just some little factor present which strikes the key-note of the whole success of the experiment. And that little factor is not one that will be present when the theory is applied to practical work.

We may take for an example the subject of natural or window ventilation that is now receiving so much attention. This system of ventilation is superior to no system at all, but we often wonder if the advocates of such a system give us all the information regarding the type of systems that they have displaced in large schools, or if they have instructed us in how the pupils in some of the schools selected as examples are given special attention regarding the lesson, sleep, and rest periods.

Therefore it seems that the best course to pursue in favor of planning a ventilating system for a school is that wherein we examine carefully every claim of the value of different systems before we decide to adopt any with the idea of its being the best.

THE HEATING OF HOSPITALS

Continued From Page 31

beds that they cause the patients a great deal of discomfort.

Direct Radiators

Direct radiators should be of the hospital type, of perfectly plain pattern with sections spaced 3½ centres. They should be mounted on stork legs, or supported from the walls on heavy cast iron brackets. There should be a space of 3 to 4 inches left between the back of each radiator and the wall. Hospital radiators set thus can be easily kept clean.

Direct radiators should not be set in enclosures unless the enclosures are built so that they can be opened in such a way that every inch of the radiating surfaces and the interior of the enclosures can be kept clean, and even then the concealment of these surfaces provide a temptation for neglect in cleaning the same.

Relative Merits

The relative merits of hot water and steam heating systems for hospitals are continually discussed. And where it is a question of the value of hot water systems and of the old style gravity steam heating apparatus, there is no doubt but that the hot water system, either of a gravity or forced circulation type, is by long odds the best system in so far, at least, as economy and convenience of operation are concerned, but there are defects in the hot water system that are not easily overcome. It is subject to freezing, and it is liable to serious damage in the case of a break in the piping. It is slow to respond to firing or checking. This last objection, however, does not apply to systems of forced circulation.

Where forced circulation systems are used, the superintendent of the heating installation must see that nothing but genuine wrought iron is used in the piping. Ordinary steel piping will not stand up against the attack of the gases liberated in the hot water.

Would Hesitate

Despite the favor of many heating engineers for water heating systems in hospitals, the writer would hesitate in specifying a hot water heating system for anything but the smaller types of hospitals where the expert services of an operating engineer is not always available. There is a certain steadiness of heating with the hot water heating plant that cannot be obtained with any gravity steam system of heating where the fires are left for a long time without attention.

Remember that so far our arguments only have to do with the relative merits of gravity steam and hot water heating systems and that no mention has been made of the faults or the merits of vacuum steam systems.

Many Advantages

There are so many advantages of satisfactory service with a high grade vacuum system that it is not at all surprising to find so many of these systems supplanting all others in popular favor.

Noise must be banished from the sick room, and as the air valve of an ordinary steam radiator is a source of noise, it must be eliminated. No air valves are required on the radiators of vacuum systems; so this is one argument in its favor.

The modulation of radiator temperature can be approximated in a vacuum system just as well as with the water system. The cost of installing the very best vacuum system will not be as great as the cost of installing a forced hot water system. The vacuum system is not as complicated as that of forced hot water.

Are Worthless

Do not look around for cheap graduating and thermostatic valves for vacuum work. Such valves are worthless and have done a great deal to bring the high grade vacuum system into disrepute.

The valves must be heavy in every part, as they are subject to considerable strain. The valve should be constructed

so that its interior may be removed without disconnecting it from the radiator or from the piping. There should be stop valves set so that any radiator may be repaired without affecting any other part of the system.

More Satisfactory

Thermostatic return valves are generally more satisfactory than float valves, because they are not so likely to be noisy. This is not saying that the best float valve is defective. Many of them are giving perfect satisfaction, but under certain conditions become noisy. The movement in the return valve should be at least one-quarter of an inch from the seat when open; anything less than this will hold water in the radiator.

The style of boiler to be used depends upon the size of the hospital. In most hospitals there is a demand made for steam at 40 and 60 lbs. pressure required for sterilizing and laundry purposes. Some small hospitals use low pressure heating boilers for heating, and a high pressure boiler for providing the steam for sterilizing, etc. This arrangement is made in the belief that the janitor can operate both boilers. It would seem to be better economy to employ a high-grade fireman, who, in looking after one fire for most of the year, would save more in the cost of fuel than the amount of his wages.

Water Tube Boilers

In plants where 1,000 boiler h.p. is required it is advisable to use water tube boilers.

Automatic stokers should be used so as to eliminate smoke when soft coal is used for fuel. They also save labor where the plant is as large as 1,000 boiler h.p. or over.

Steam pumps should be of the single cylinder pattern, because, while they cost more than those of the duplex type, they are more economical in the consumption of steam.

All hospitals should have automatic temperature regulation, as such a system prevents overheating and this affects economy in fuel. The thermostats should be of the intermediate acting type, set in such a way that a graduating movement is exercised on the radiator valves, as well as on the air supply dampers. When a gravity steam system is used, the thermostats must be of the direct acting pattern.

Piping Arrangements

The piping of a large hospital may be described as follows:

First: The high pressure piping for the maximum pressure required. If the lighting plant is run by this system the boiler pressure will be 80 to 100 lbs.

Second: The piping for the sterilizers, 60 lbs. pressure.

Third: The piping for the laundry apparatus, 60 lbs. pressure.

Fourth: Piping for kitchen apparatus, 30 to 40 lbs. pressure.

Fifth: Piping for the heating apparatus, usually 2½ lbs.

Each system of piping is to be fed with steam from the boiler through independent automatic pressure-reducing valves.

The piping should not be concealed, unless behind covers that can be easily removed in case of necessary repairs.

Closely Related

Although the plumbing equipment of one hospital may be considered as being independent of the heating or ventilating system, there are certain units of each that are so mingled in their functions with that of the other that it becomes necessary to consider certain of the plumbing details when writing of the heating system. One of these details is that of the hot water supply.

It is generally the opinion of most authorities that the hot water supply is best furnished by means of large storage tanks containing steam coils. This provides for a large storage of hot water and guards against the sudden demands on boiler capacity caused by instantaneous water heaters and local mixing valves. The temperature of the water must be controlled by automatic thermostats so that patients will not be scalded.

No Standard System

Now to return to the subject of ventilation. No standard of ventilation can be set for all hospitals. A standard of requirements for air purity may be set, but no standard for equipment can be. That must be controlled by the nature of the location and the size of the building. As an illustration we may say that it is only a very small hospital that can possibly get along with a gravity system of ventilation, but at the same time it would be the height of folly to specify an elaborate ventilating system with air conditioning apparatus for a medium-sized building in a rural community. But when a hospital is situated amid dusty city streets the best system of artificial ventilation is hardly good enough.

Standard Requirements

The standard requirements of air conditions and temperatures are for a hospital approximately as follows:

Air supply, 2,100 to 5,000 cubic feet per hour per bed. A temperature not exceeding 68 degrees above zero, except at times in operating rooms. A relative humidity of from 30 to 50 per cent. The lower humidity is provided for very cold weather, as a higher humidity would frost the windows, and so far no proof has been given that a relative humidity as low as this is harmful.

In hospital work it is dsirable to have the air current moving horizontally, rather than up or down. This is more fully covered in the articles under the heading of "Ventilating the Modern School."

System Described

The tenth article of the same series was descriptive of a system of combined heating and ventilation for a school, but it could easily be adapted for the heating and ventilating of hospitals. When using a system similar to that there described, there should be an alternating damper set under the radiators in the enclosures, so that in the event of the fan stopping a certain measure of heat could be obtained by using the enclosed radiators just as ordinary direct radiators are used. More heating surface in proportion to the size of the rooms will be required here than in school house work.

When the problem is the heating and ventilating of a contagious disease hospital, there are some details peculiar to that which must receive our attention. Perhaps the easiest way of drawing the reader's attention to these details is that of describing how the usual requirements are met.

As a rule, no direct radiators are used in such a building, except in the service portion. The reason for this lies in the fact that a radiator is an additional surface, where dust and germ colonies may collect, especially during the summer months.

Fresh air is driven into the room, both as a heating and ventilating agency.

The air exhausts are greater in number than those found in general hospitals, and they are always connected to a powerful exhaust fan. All exhaust air is passed over fires, where the germs are killed, or the exhaust air is turned into a chamber where a jet of superheated steam is used to kill the germs. Either in general or in other hospitals the use of metal ducts is advisable in preference to those of masonry. They are cleaner than masonry and offer less resistance to the flow of air.

SHEET AND WIRE PRODUCTS

Continued from page 29

especially in the Pittsburgh district, and this is being taken into account in regulating future sales. A strike for higher wages has put out of commission temporarily three blast furnaces in the Jackson, O., district.

Automobile and farming implement manufacturers have been among the week's most conspicuous buyers. Accessory and parts manufacturers have continued to place sizable contracts and specifications. The Moline plant of the Republic Iron and Steel Co. has resumed operations especially to serve the farming tool demand.

Advances are appearing in some of the minor lines. Various nut and bolt makers have boosted their schedules 5 per cent. In small rivets, $10 to $15 a ton has been added. Some rerolled bar makers now quote 2.35c mill, a rise of $2 per ton. Talk of early advances in wire products persists and some makers are restricting their present offerings, especially for third quarter. Some buying of pig iron for 1920 delivery has been done, although makers generally are discouraging any contracting so far ahead.

Subscribers Are Urged to Send in Questions to be Answered, or to Comment on Letters Published--Description of Jobs Done or Shop Kinks Are Also Invited.

Editor, SANITARY ENGINEER,

Dear Sir,—Having been a subscriber to your paper for the last ten years and always interested in the question and answer department, I would greatly like to have you note the enclosed rough sketch of proposed steam-heating in local plant. The old low-pressure heating has been in the building about ten years and gives satisfaction, but the building is being taken over by another firm, who wish to use high-pressure steam in connection with some steam kettles. They also wish to heat the building from a new h.p. boiler. We would like you to send us a sketch of this work as you would consider the best way of doing same, also mark sizes of pipe used. We would like to hear from you as soon as possible in enclosed envelope as this work is waiting to be installed.

Yours truly,
A. C. FRASER.

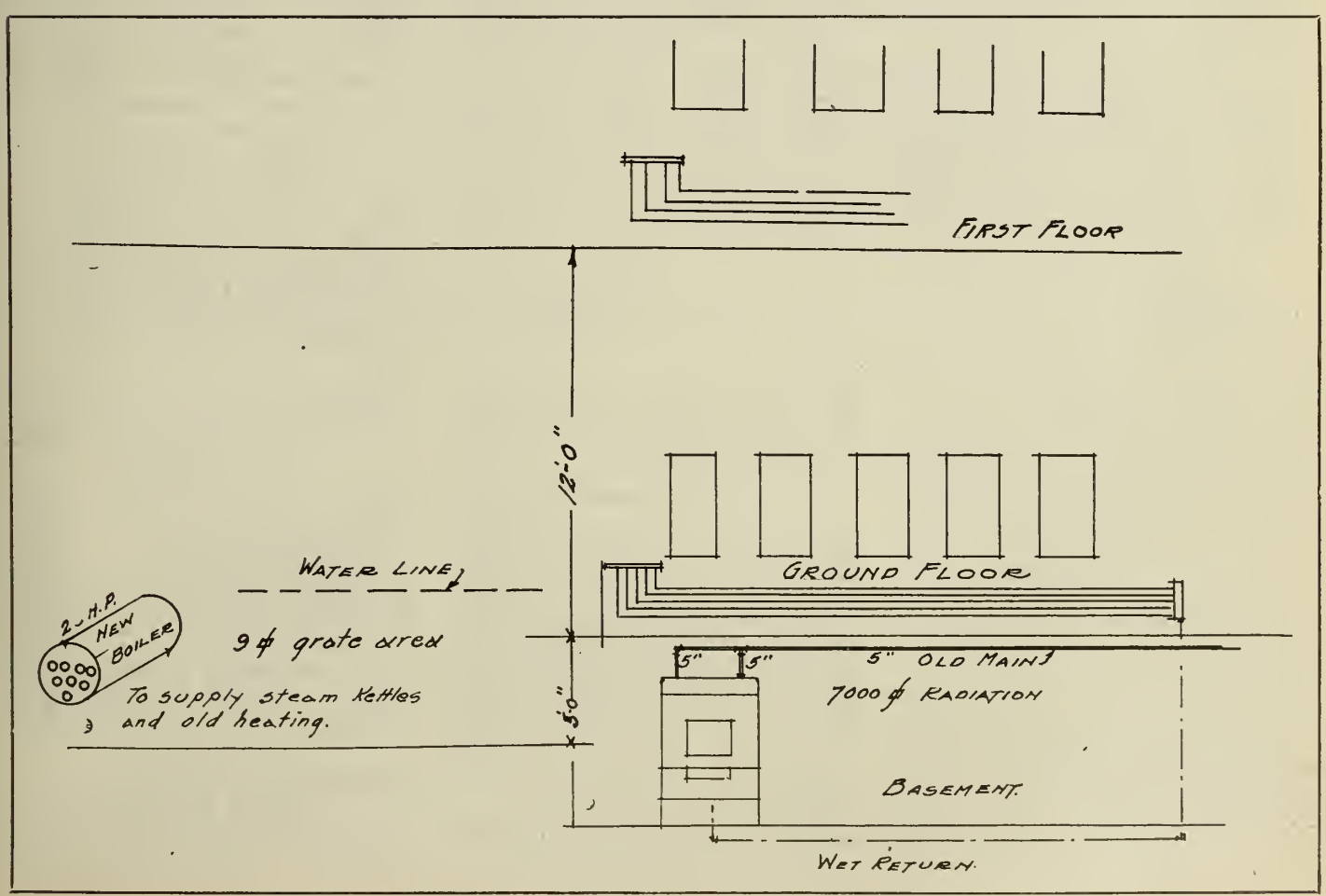
Answer.—We note that your figures for the present system of heating is 7,000 sq. ft. of radiation. A 20 h.p. boiler is not enough to carry that load of radiation; neither is a 5 in. main large enough to carry that load properly unless very high pressures are carried.

It will not be practicable to use these boilers in conjunction on account of the different levels of water lines and the difference of pressure.

You do not give us any data regarding the number of steam kettles, nor the pressure required. It is necessary that we have this information before we can make any recommendation with regard to the piping required.

If no higher pressure is required at the kitchen than for the heating system, both systems of piping may be fed from one opening in the boiler header, but as the pressure required for kettles used

Continued on Page 38



Market Conditions and Tendencies

STATEMENTS REGARDING SUPPLIES AND TREND OF PRICES

THE MARKETS AT A GLANCE

THE effects of the big steel strike in the United States is beginning to show in firmer prices for galvanized and black sheets, indefinite promises of deliveries and general uncertainty regarding future business. Dealers whose stocks were incomplete have been busy trying to fill up their shortages, with the result that as few of the jobbers had any great amount of stock supplies generally are low. The question of delivery looms large, with many firms who have business in hand for which they require the goods, and in many cases, it is stated, goods now on order may not reach the buyers until December or January, perhaps not then if a railway strike materializes.

There has been some improvement in the delivery of soil pipe, but it is only slight and buyers are still complaining of hand-to-mouth deliveries and shortage of supplies. The same condition applies to some lines of brass goods.

One result of the strike in the United States has been to make ingot metals easier, because manufacturers using lead, zinc, and other lines cannot get the supplies of raw materials they require, and hence the demand for ingot metals is temporarily slackened.

There is a prospect of an advance before very long in copper and brass goods. The situation centres around whether European nations, especially Germany, become heavy buyers of copper. It is generally expected that as soon as the question of credits has been satisfactorily arranged large shipments will be made and this will result in higher prices for copper.

Lead prices show a decline of a quarter of a cent a pound.

Business is reported as excellent, with inquiries that indicate a steady volume for some time to come. The only trouble dealers foresee now is in getting the goods to supply their customers. A lot of building continues to develop all over the country, and the house shortage continues general.

TORONTO, October 1.—Scarcity of goods in many lines rather than price changes is the feature of the markets at the present time. As a result of the difficulty in obtaining bathtubs and some other lines of enamelware, soil pipe and some lines of fittings, considerable work is being delayed. Deliveries have been very slow on some sizes of valves and there seems to be a steadily growing scarcity of wrought pipe. Some of these troubles are traceable in some degree to the big steel strike in the United States. Others are due to lower production.

The situation in regard to deliveries from American points seems somewhat uncertain and is affecting such goods as sheets, plates, tubes and bars. The strike, on the other hand, has had the effect of making the market for ingot metals somewhat easier by lessening the demand. There is a probability that the copper market may stiffen considerably very shortly as a result of large purchases to be made by Germany and other European countries. This advance, if it occurs, will affect brass and copper goods generally.

Business in general is reported remarkably good. Building activity continues and plans which are now going forward indicate that much new work is developing. The main trouble with many seems to be to get enough goods to supply the orders they have in hand.

Shortage in Some Lines of Enamelware

ENAMELWARE. — Considerable scarcity is reported in bath tubs and some other lines of enamelware and this is delaying work. Manufacturers are having difficulty in obtaining the labor required, and in some cases are further hampered by slow deliveries. Prices are unchanged and on a few of the well-known lines the quotations are:

Bath tubs, roll rim, 4. 4½, 5 feet, 24 to 30 in. wide	$37 07
Bath tubs, 5½ ft.	41 27
Lavatories—	
17x10" Apron F139 or P4045	11 00
18x24" Apron F154 or P3845 or P3847.	17 00
18x21" Apron F169 or P4205	12 70
18x21" Roll rim F197, F199 or P4655-6	11 10
17x19" Roll rim F241 or P4345	9.05
Sinks, roll rim, 18 x 30 in.	16 60
Sinks, flat rim, 20 x 30	6.77-6.65
Do., 18 x 30	6.07-6.19
Do., 16 x 24	5.29-5.45
Closets, oak tank and seat	26 50
Do., enamel iron or white vitro tank	30 00

Soil Pipe, Fittings None Too Plentiful

SOIL PIPE, FITTINGS.—While there has been an improvement in the situation in regard to soil pipe and fittings, there continues to be a scarcity. Enough goods is being turned out to keep many users going, but some others report that they are not getting goods as fast as they require them with the result that work is delayed. The situation generally is expected to show continued improvement. Quotations show no change and are as follows:

Medium and extra heavy soil pipe, 2, 3 5 and 6 in.	10%
Medium and extra heavy soil pipe, 4 in.	15%
Medium and extra heavy soil pipe fittings, 2 in. to 6 in.	25%
8 in. extra heavy pipe and fittings	5%

PIPE FITTINGS

Cast iron fittings	10%
Plugs	22%
Bushings	25%
Unions, ¼" to 2½"	40%
Do., ⅛", 3" and larger	35%
Dart unions, ¼-inch to 2-inch	25%
Do., 2½-inch and larger	15%
Nipples, up to 4-inch	80%
Do., 4½-inch and larger	70%
Do., running thread 4-in. and under	50%
Couplings, 4-in. and under	40%
Do., 4½-in. and larger	20%

MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittings, Class A, lb.	$0 57	$0 72
Do., Class B, lb. net	0 25	0 35
Do., Class C, lb. net	0 19	0 25

Unchanged Prices For Range Boilers

RANGE BOILERS.—Sales of range

boilers as might be expected owing to the steady growth of binding, have been active. Deliveries are reasonably prompt. Quotations remain unchanged and are as follows:

Range Boilers	Standard	Extra Heavy
30-gallon	$11 00	$12 50
35-gallon	13 50	15 50
40-gallon	15 25	17 25
52-gallon	20 50	25 00
66-gallon	32 00	38 00
82-gallon	40 00	47 00
100-gallon	50 00	58 00
120-gallon	60 00	67 00

Some Brass Goods Are Reported Scarce

BRASS STEAM GOODS.—Prices so far show no change, but if reports regarding advances to be made in copper shortly materialize, it is likely that high quotations may be made. Reports indicate that European buyers are coming into the market heavily for copper before long, in fact as soon as the necessary credits now being arranged are completed. In this case, an immediate jump in copper is expected, and will be reflected in brass goods. Some scarcity is reported, especially of some lines of valves. While a fair amount of business in marine work is being handled, there has been some falling off in the volume owing to inactivity in British Columbia in shipbuilding. Generally speaking, though, business in brass goods has been very fair. Quotations are as follows:

Compression work, standard	35
Fuller work, standard	40
Bath cocks, compression	37
Bath cocks, Fuller	40
Flatway stop and waste cocks, standard	38
Roundway stop and waste cocks, standard	38
Brass steam cocks, standard	Net List
Globe, angle and check valves, standard	5%-23%
Do., removable disc	10%-22%
Radiator valves, standard	15%-23%
Do., removable disc	Net list to 40%
Basin Cocks—	
No. 0 and 1, Fuller pattern	40
Compression	30
Quick opening	40

Wrought Pipe Scarce; Prices May Be Advanced

WROUGHT PIPE.—While no change has yet been made in prices, an advance would occasion little surprise. Supplies are reported increasingly scarce with little outlook for improvement. Many of those in the trade have reached the point where they can barely keep going with the amount of goods that is reaching them, and this situation is causing some inconvenience. The quotations are as follows:

WROUGHT PIPE
Price List No. 40, July 4, 1919

Standard Buttweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
⅛ in.	$ 6 00	$ 8 00	$.....	$.....
¼ in.	4 53	6 66	5 13	7 26
⅜ in.	4 53	6 66	5 13	7 26
½ in.	5 99	7 57	6 84	8 42
½ in.	7 53	9 66	8 68	10 81
1 in.	11 14	14 28	12 84	15 98
1¼ in.	15 07	19 32	17 37	21 62
1½ in.	18 01	23 10	20 76	25 85
2 in.	24 24	31 08	27 94	34 78
3 in.	50 87	65 03	.....	.....
2½ in.	38 90	49 73	.....	.....
3½ in.	64 86	81 88	.....	.....
in.	76 85	97 01	.....	.....

Standard Lapweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
2 in.	$ 27 94	$ 34 78	$ 31 64	$ 38 11
2½ in.	40 66	51 48	46 51	57 33
3 in.	53 17	67 32	60 82	74 97
3½ in.	66 70	83 72	75 90	92 92
4 in.	79 03	99 19	89 93	110 09
4½ in.	88 00	113 00	107 00	132 00
5 in.	103 00	132 00	125 00	154 00
6 in.	133 00	171 00	162 00	200 00
7 in.	175 00	224 00	211 00	259 00
8L in.	184 00	235 00	221 00	273 00
9 in.	254 00	324 00	305 00	376 00
10L in.	235 00	301 00	283 00	349 00
10 in.	303 00	387 00	365 00	449 00

Terms, 2% 30 days, approved credit.
Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Strike is Affecting Boiler Tube Market

BOILER TUBES.—The strike across the line has occurred at an opportune time, as far as the tube situation is concerned. Stocks are very low and it is practically impossible to obtain some sizes in any quantity. Just what the situation will be in the future depends on how long the strike lasts. An advance in prices is expected in many quarters. At the present time the outlook for deliveries seems to be slow. Quotations are as follows:

BOILER TUBES—	Per 100 feet Seamless	Lapweld
1 inch	$27 00	.....
1¼ inch	29 00	.....
1½ inch	29 50	.....
1¾ inch	32 00	$27 00
2 inch	31 00	26 00
2¼ inch	35 00	28 00
2½ inch	43 00	32 00
3 inch	48 00	40 00
3¼ inch	.....	47 00
3½ inch	60 00	44 00
4 inch	75 00	56 00

Sheets and Plates Likely to Advance

SHEETS AND PLATES.—The market for both sheets and plates is very firm. Following the strike there has been a rush on the part of dealers whose stocks were imcomplete to fill them up and as jobbers did not have heavy stocks on hand, many of these have been badly broken up. Higher prices are looked for with trouble developing as a result of slow deliveries. Canadian firms have large quantities of goods on order, but owing to the conditions prevailing, it is uncertain when they will get the stock. Quotations are being made on the following basis:

BLACK SHEETS—	
14 gauge	5 45
16 gauge	5 60
18-20 gauge	6 15
22-24 gauge	6 20
26 gauge	6 30
28 gauge	6 45
3-16 inch plate	6 25
¼-inch boiler plate	5 80

Prices shown are for full cases. An extra charge of from 25c per 100 lbs. is made for less than case lots.

GALVANIZED SHEETS.		
10¾ oz.	$8 20	$8 85
U.S. 28	7 80	8 30
U.S. 26	7 30	7 90
22 and 24	7 15	7 65
18 and 20	7 00	7 45
16	6 85	7 25
12 and 14	6 70	7 05

An extra is now charged on galvanized sheets, 10¾ oz. and 28 ga., when shipped out in sheets 3 feet wide. The extra charged over prices shown above is 20c per 100 pounds. Other gauges show no change for different widths.

Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

Prices Hold Firm For Waste and Oakum

WASTES, OAKUM.—A fairly good volume of business is being handled in both of these lines. Prices are holding firmly and quotations are on the following basis:

	Per 100 lbs.	
Best American	$21 00	$22 00
Clipper, spun	.....	21 00
Do., unspun	.....	10 50
Plumbers' spun	10 00	10 75

Market is Steady For Lead and Zinc

LEAD AND ZINC PRODUCTS.—Business has been good in these lines and the prospects are for continued activity. Prices are not expected to show any material change for some little time.

Lead pipe, list, per lb.		$0 12½
Lead waste pipe, list, per lb.		0 13½
Do., over 6 inches, list, per lb.		0 14½
Above subject to discount of 10%.		
Lead traps and bends		15%
Lead wool, lb.	0 11	0 12½
Lead sheets, 4 to 6 lbs., sq. ft., in rolls, lb.	0 12	0 13
Cut sheets ½ to ¾c lb. extra and cut sheets to size, 1c lb. extra.		
Solder, guaranteed, lb.	$0 35½	$0 38
Solder, strictly, lb.	0 34½	0 37
Solder, commercial, lb.	0 32½	0 35
Solder, wiping, lb.	0 31½	0 34
Solder, wire, lb.	0 35½	0 41
Zinc sheets, per lb.		0 17

Scrap Market is Hit by the Strike

OLD MATERIALS.—The strike in the United States has had the effect of stagnating business in the scrap market and there has been a considerable weakening of prices. Prices prevailing at the present time are:

Dealers' Buying Prices—		
Tea lead		0 03½
Heavy lead pipe		0 05¼
Pipe scrap		8 00
Stove plate, per ton		12 50
No. 2 busheling		11 00
Yellow brass		0 10
Red Brass		0 16¾
Light brass		0 07
Scrap zinc		0 06
Heavy copper		0 18
Wrought iron, No. 1, per gr. ton		14 00
No. 1 machinery cast		18 00
Heavy melting steel		14 00
Old rubbers, boots and shoes		0 07
Overseas, lumbermen's rubber boots		0 05
Bicycle tires		0 1½
Automobile tires		0 03

Ingot Metals Easier As Results of Strike

INGOT METALS—A general tendency towards easier prices, with the exception of copper, is one of the results of the strike across the line. This is accounted for by the fact that firms cannot get the raw materials in which the various ingot metals are used in the course of manufacturing. Copper prices are firm and if European buyers come into the market shortly, an advance is expected. It is stated that Germany is arranging for large purchases.

COPPER.—Copper quotations remain steady at present at 27 cents a pound. The future depends largely upon the course taken by European buyers, and one jobber stated to SANITARY ENGINEER that if Germany comes into the market, there will be the biggest boom copper has had for some time.

TIN.—Trade in tin is quiet but the market shows a tendency to be firmer. This is a peculiar situation in view of the

fact that tin is easier at primary points, but it hinges on the fact that shipments from England owing to labor troubles are likely to be greatly delayed. Stocks are only fair. Present quotations range around 57½ cents a pound.

SPELTER.—With a fair volume of business offering quotations on spelter show no changes.

LEAD.—The demand for lead has slackened as a result of the strike, with the result that prices have declined a quarter of a cent a pound and quotations are now being made at 6¾ cents.

ANTIMONY.—Business is inclined to be quiet. The market remains unchanged and quotations range from 10 to 11½ cents a pound.

ALUMINUM.—Trade is reported somewhat quiet. Prices are holding without change at 35 cents a pound.

THE QUESTION BOX

Continued from Page 35

for cooking purposes ranges from 20 to 40 pounds, and as the pressure required for the heating plant should not be more than 5 pounds, in ordinary practice it would be necessary to feed the heating system through a pressure-reducing valve.

The water of condensation from both systems may be run into a common receiver and from there pumped back into the boiler. In this case it will be necessary to have a balance pipe connecting the return from the kettles and the receiver, so that the higher pressure from the kettle returns may not prevent the return of condensation from the heating system.

Or the condensation from the two systems may be returned to the boiler by means of a single or a double return-trap system instead of a pump.

If you will kindly verify these figures of 7,000 sq. ft. of radiation and give us the exact height of the water-line in the boiler, also the levels of the steam kettles, we will send you immediately a drawing showing how the feed and return connections should be made at the boiler.

Editor, SANITARY ENGINEER,

Dear Sir.—We should like to get improved pump part patented. Kindly let us know how we can get it done.

Yours truly,
JACQUES BROS.

Answer.—You may procure a patent on your improved pump part in the United States by making application to the Commissioner of Patents at Washington, D.C., and in the Dominion of Canada by making application to the patents branch of the Department of Agriculture at Ottawa, Ont.

It would be wise to make your application first to Washington, enclosing the first fee of $15, together with your petition, a specification of the pump part, an oath regarding your personal right to install'ed, and he now states that a dirty the claim and drawings, and, if required, a model.

The petition must give the name and full address of the applicant. It must give a title to the invention. It must contain a reference to the specification for a description of the invention, and it must be signed by the applicant.

In the specification there must appear in this order, name and residence of the applicant; title of invention; a general statement of the nature and object of the invention; a description of the views of the drawing (if the invention is shown in a drawing); a detailed claim or claims; signature of the inventor and signatures of two witnesses.

If the applicant is the inventor he must make oath that he believed himself to be the first inventor or discoverer of that which he seeks to have patented.

The oath must state of what country he is a citizen, and where he resides.

If you make your application in Canada before you do in the United States you must state this in your oath.

Drawings are to be made on white paper with india ink, and the sheets must be exactly 10 by 15 inches in size, with a margin of one inch. All details must be shown clearly and without any superfluous lines.

The United States fees are: First application, $15; on issue of patent, $20.

Now, while anyone may secure a patent without hiring an attorney, inventors have usually found that the small fees that such men charge are well earned. The wording of the statement of claim or claims has a great bearing on the protection a patent gives your right of invention. We understand that Prof. Bell hired no attorney when he made his application for a patent on the telephone, and his specification left no loophole as a convenience for the commercial pirate, but Prof. Bell must have given the subject of specifications long thought before he sent his in. It is the attorney's business to protect his client, and if there is any ground for protection the attorney will find it, because he is trained for that kind of work.

EXPORTS ARE HEAVY

Reports from the South state that the outlook favors good exports, particularly of rosins, the next two or three weeks. From all parts there will be an outward movement that will probably be in excess of the fresh receipts from the woods, to the foreign shipments being added a movement to the interior for the fall requirements of the consuming industries which promises to be of large proportions unless the strike spirit spreads and dominates the industrial situation to such an extent as to check production in the lines using naval stores. Labor seems to be showing some of the signs of the spirit that moved the blinded Samson when he pulled down the pillars of the temple and brought death to himself as well as to his enemies.

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Round Brass Rod

Mill lengths of the following sizes:—	Diameter
30,000 lbs... .250"	¼"
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62,500 lbs... .625	⅝"
73,250 lbs... .750	¾"
27,500 lbs... .9375"	15/16"
46,750 lbs...1.000"	1"
45,000 lbs...1.250"	1¼"
26,000 lbs...1.375"	1⅜"
39,000 lbs...2.000"	2"

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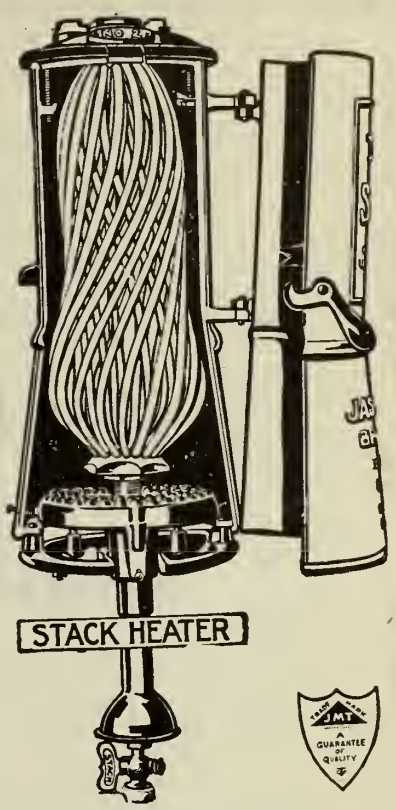

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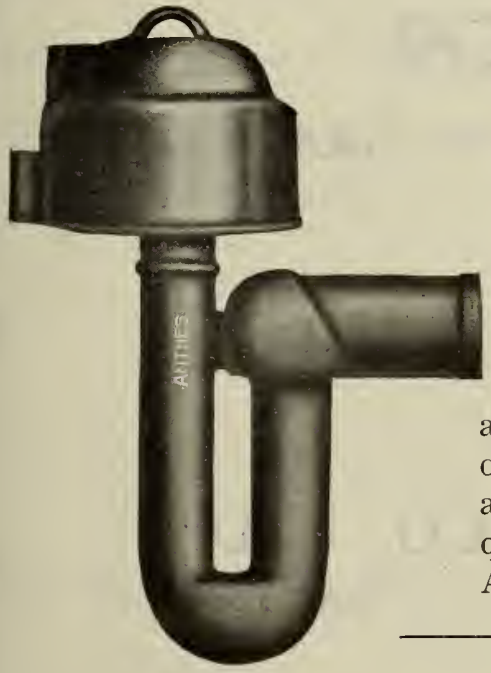

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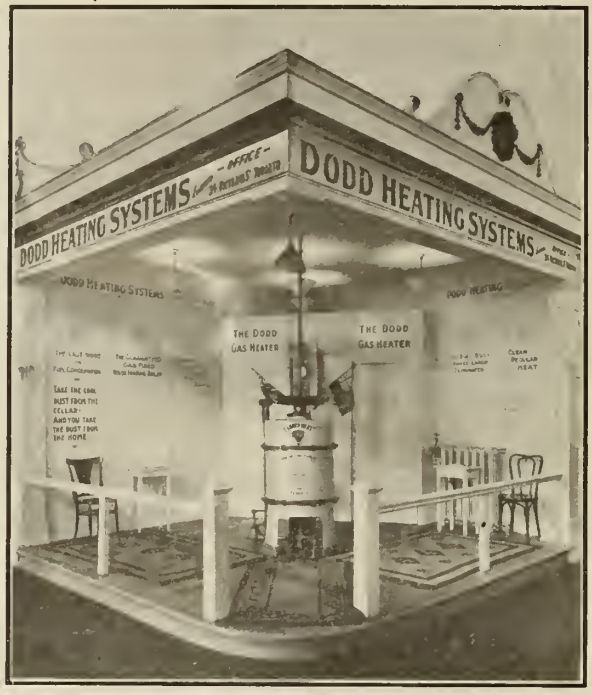

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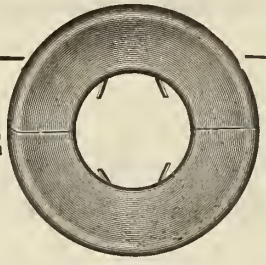

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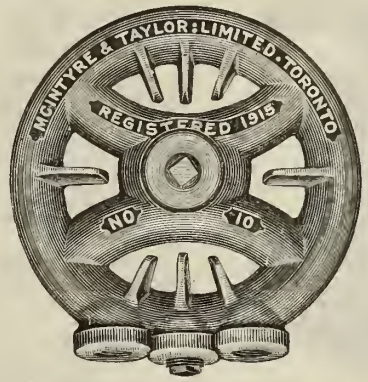

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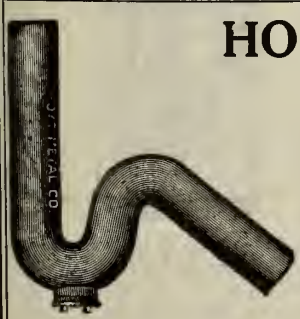

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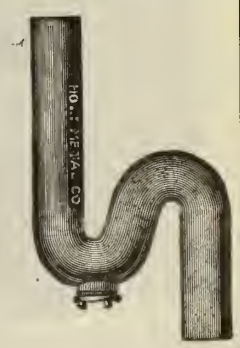

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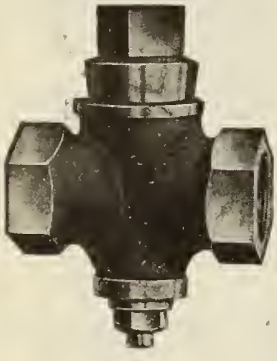

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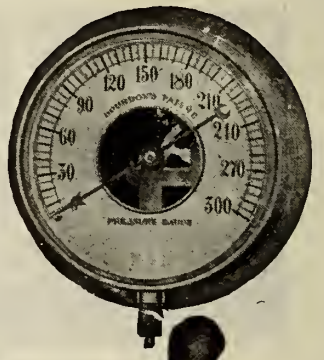

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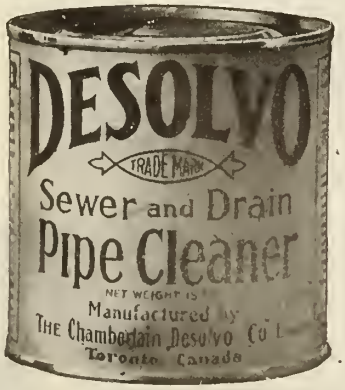
If you are interested in any or all of the lines mentioned, and are in a position to take a hand in the energetic distribution of the same, please communicate with us NOW to our Head Office, at above address.



A Quick Selling Pair

For all around domestic utility, they appeal to the housewife.
Desolvo clears clogged pipes instantly by heat and chemical action.
K. K. Cleans Closets in a jiffy and makes a disagreeable job pleasant.
Naturally, they sell well and with profit.

Order from your jobber.

The Chamberlain Desolvo Co., Limited

110 Church St., Toronto

Eastern Canada Representatives:
RICHARDSON & BUREAU,
55 St. Francis Xavier St.,
Montreal, Quebec.

ADVERTISING INDEX

Allison, K. B. 44
Amherst Foundry Co. ..... Inside Front Cover
Anthes Foundry Co. 39
Armstrong Mfg. Co. 48
Beaton & Cadwell 42
Beaton & Corbin 48
Borden Canadian Co. 48
Canada Metal Co. 13
Canadian Brass Co. 9
Canadian Society of Domestic and Sanitary Engineers 10
Canadian Tube & Iron Co. 47
Chamberlain Desolvo Co. 44
Commercial India Rubber Co. 48
Dodd Heating Systems, Ltd. 42
Dunham, C. A., Co., Ltd. 3
Empire Manufacturing Co. ..... Outside Front Cover
Fittings Limited 6
Gummer, G. W. G., Ltd. 2
Galt Brass Co. ..... Back Cover
Gurney Foundry Co., Ltd. 48
Hall, J. H. 47
Hamilton Stove & Heater Co. 38
Hause Mfg. Co., Chas. F. 48
Hoyt Metal Co. 43
Hungerford, U. T. 47
Imperial City Heaters, Ltd. 46
International Malleable Iron Co. ..... Inside Back Cover
Jardine, A. B., & Co. 4
Jenkins Bros., Ltd. 45
Katie Foundry, The 43
Kerr Eng. Co., Ltd. ..... Inside Back Cover
Long, R. G., & Co. 43
McDougall & Co., R. 47
McIntyre & Taylor, Ltd. 43
Modern Heating & Engineering 3
Moline Heat 7
Morrison Brass Mfg. Co., Ltd., Jas. 39
Mueller Mfg. Co. 37
National Steel Tank & Mfg. Co. 4
Port Hope Sanitary Mfg. Co. 14
Scaife & Sons Co., Wm. B. 46
Standard Sanitary Mfg. Co. 1
Steel & Radiation, Limited 6
Sturtevant, B. T., Co. 8
Taylor Forbes Co. 11
Trimont Manufacturing Co. 42
Toronto Hardware Mfg. Co. 46
United Brass Founders & Engineers, Ltd. 44
Victory Loan 5
Wallaceburg Brass & Iron Co. 41
Warden-King, Limited 7
Williams, J. H., & Co. 11
Wolverine, Ltd. 11

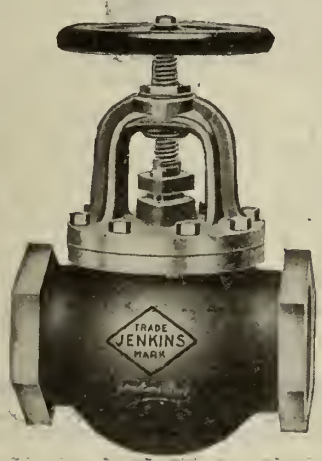


FIG. 141

JENKINS BROS.

Standard Pattern Iron Body Globe Valve Screwed with Yoke.

For use under steam service there are no valves quite as satisfactory as

JENKINS BROS.

Globe and Angle Valves

Fitted with Jenkins' No. 119 Discs

The composition of the disc is very hard, but becomes tough and flexible in service when under steam pressure.

It shows remarkable freedom from cracking and flaking and unrivalled durability in working steam pressures up to 150 pounds.

Write for Catalogue No. 8

Factory and Head Office of JENKINS BROS., LIMITED, Montreal, Canada.

JENKINS BROS., Limited

103 St. Remi St. MONTREAL

6 Great Queen Street, Kingsway, London, W.C. 2, England

Steel Tanks for Every Purpose

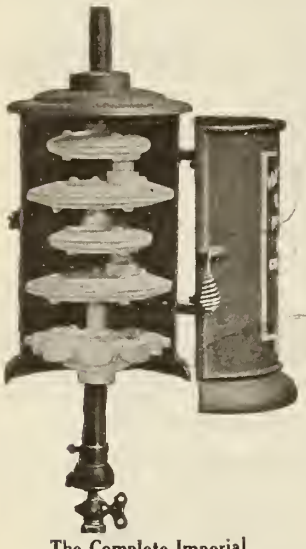
A FEW "SCAIFE" SPECIALTIES:

Air Receivers
Boilers—Hot Water
Expansion Tanks
Filters (water)
Hot Water Tanks
Hydro-Pneumatic Tanks
Range Boilers
Tanks (steel)
Water Supply Tanks

117 years old Founded 1802

WM. B. SCAIFE & SONS CO.

New York, N.Y. Office: 26 Cortlandt St. Home Office: Pittsburgh, Pa.
Chicago: 38 South Dearborn St.

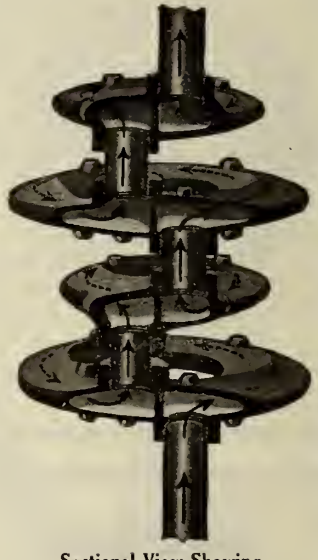


The Complete Imperial Water Heater

BY installing "IMPERIAL" heaters, you serve your customers' interests, as well as your own.

"IMPERIAL" heaters, are made in three sizes, for the ordinary, heavier, or heaviest requirements.

PERFECT HEAT baffling. Absolute water CIRCULATION.



Sectional View Showing Water Flow

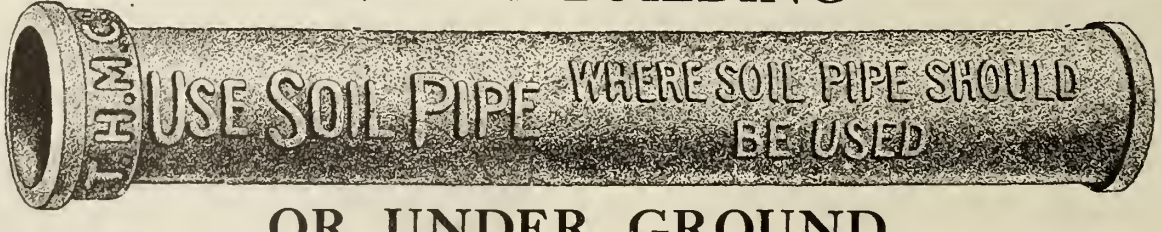
POWERFUL. ECONOMICAL.

For either ARTIFICIAL or NATURAL Gas.

IMPERIAL CITY HEATERS, LIMITED

SARNIA, CAN.

IN THE BUILDING



OR UNDER GROUND

ASK YOUR JOBBER FOR T.H.M. CO. BRAND OF SOIL PIPE AND FITTINGS.

TORONTO HARDWARE MFG. COMPANY, - Toronto, Canada

WE MANUFACTURE A FULL LINE OF HIGH-GRADE RANGE BOILERS

WROUGHT PIPE

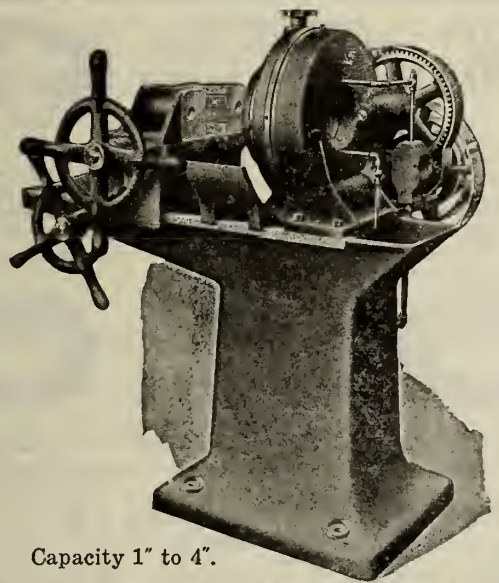
BLACK and GALVANIZED SIZES, 1/8 IN. TO 4 IN.

All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

All Sizes of NIPPLES (Black and Galvanized)

Ask your jobber for CT *Brand of Wrought Pipe*

CANADIAN TUBE & IRON CO., LIMITED, MONTREAL Works: Lachine, Can.



Capacity 1" to 4".

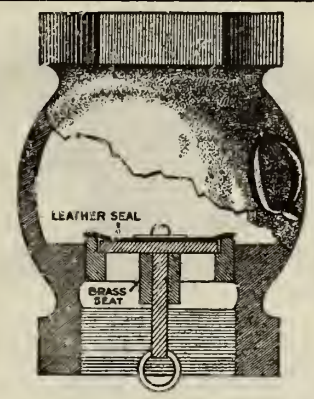
The Hall Simplex Improved No. 4 Pipe Machine

Easily operated by unskilled help. An ideal machine for the plumber, the steamfitter or the jobber. Will thread pipe as short as 4½ inches. Let us mail you full information regarding this money saver together with catalog covering our complete line including:

Pipe threading machines ... ⅛ to 18"
Nipple machines ..... ⅛ to 4"
Roller pipe cutters ..... ⅛ to 4"

Delivery from stock.

JOHN H. HALL & SONS, LIMITED
BRANTFORD, CANADA



This is a "Q" Foot Valve

And it Just *CAN'T* Leak

There are more pump troubles caused by "leaky" valves than from all the wear and tear which occurs in the average life of a pump.

The "Q" valve will overcome all priming troubles, and water once raised above it, through the suction line, will not leak out.

If you want the pumps you instal to give maximum, you will require to use the only valve on the market that JUST CAN'T LEAK.

Made in sizes from 1 to 8-inch.

R. MACDOUGALL CO., LTD.
GALT., CANADA

PIPE AND THE PUBLIC WELFARE

By R. C. McWANE

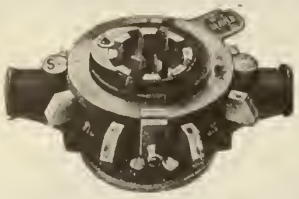
A Book Every Sanitary Engineer Should Possess.

Every sanitary engineer should read this book. It deals with pipe-making of all kinds, cast iron, wrought iron, steel, wood and tile pipe. It is valuable because it gives the users of pipe a true idea of how pipe lasts under various conditions when in service, and its uses in sanitary installations.

Price $1.00 Postpaid

MACLEAN PUBLISHING CO., LIMITED, Book Dept., University Ave., TORONTO

Constant Sales Increase



6 Beaverette to ¾ inch.

This efficient little die stock has been about 10 years on the market with constantly increasing sales.

The only tool that threads ¼, ⅜, ½ and ¾ without changing dies or bushings. Two sets of dies are operated by one handle.

Beaver 25 and 26 1 to 2" are alike except that 26 has ratchet attachment. They operate on the Beaver receding die principle—the further you thread the easier the labor. A man of ordinary strength can cut a 2-inch thread with one hand. Together these tools cut ¼ to 2-inch pipe without change of dies or bushings.

No. 25 Plain 1 to 2 inch.

Borden-Canadian Co.
110 Church Street - Toronto

GENUINE
ARMSTRONG STOCKS and DIES

Hinged Pipe Vises *Pipe Cutters*
Pipe Threading Machines

—MANUFACTURED BY—
THE ARMSTRONG MFG. Company
317 Knowlton Street, BRIDGEPORT, CONN
248 Canal Street, NEW YORK

"BC"
COMBINATION COLD ROLLED STEEL Floor and Ceiling PLATES
Carried by the leading supply houses

No. 15

Puts just the right finish on that heating job

Send for catalog of complete line of "B. & C." goods.

No. 1 Valve

Stock carried by our Canadian Representative
W. H. CUNNINGHAM & CO.
183 Church Street
Toronto, Ont.

No. 16

The Beaton & Corbin Mfg., Co.
Southington, Conn., U.S.A.
The Old Original Company

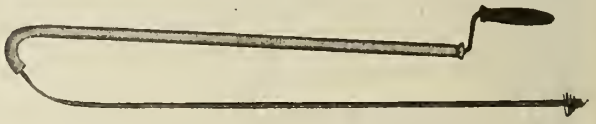
No. 17

"Star Brand" Seamless Brass and Copper Tubes
including
Iron Pipe Sizes
also
Seamless Brass Condenser Tubes
READY FOR IMMEDIATE SHIPMENT
from our New York Warehouses

Also a complete line of Mechanical Cold Drawn Seamless Steel Tubing

U. T. Hungerford Brass & Copper Co., Lafayette, White and Franklin Sts., New York, U.S.A.

Chas. F. Hause Mfg. Co., Ltd.
Manufacturers of the
Hause Closet Auger
Seamless brass tube—high-grade 7-16 steel spring. Made with 3-foot and 6-foot springs.



Ask your jobber or write us direct. Made in Omaha, Nebraska, U.S.A.

Canadian Distributors
Empire Mfg. Co., Ltd., London and Toronto

"VALVENE" Discs (REGISTERED)

Specially prepared for Hot and Cold Water Taps. All sizes from ½ inch to 1½ inches. Soft, Pliable, and "Joint-Perfect."
Price List and Samples on Application.

THE COMMERCIAL INDIA RUBBER MANUFACTURING & SUPPLY CO., LIMITED
SOLE MANUFACTURERS
586 Commercial Road London, E 1.

GURNEY-OXFORD BOILERS RADIATORS
FOR HEATING ANY DESCRIPTION OF BUILDING BY STEAM OR HOT WATER
THE GURNEY FOUNDRY CO. LIMITED
TORONTO MONTREAL CALGARY WINNIPEG VANCOUVER

Pipe Fittings

Made in Canada

M Brand Pipe Fittings, etc., give a service and satisfaction that will invariably get you re-orders and much new business as well.

A trial of the goods will prove this claim.

CAST IRON FITTINGS

With this brand mean fittings made with iron of high tensile strength—proper proportions and correct tappings.

RECESSED DRAINAGE FITTINGS

MALLEABLE FITTINGS

With this brand mean fittings made of Air Furnace Refined Iron, reamed and tapped to gauge with perfect threads

Standard and Extra Heavy Flanged Fittings and Flanges. Galvanizing Malleable and Gray Iron Castings of all Kinds.

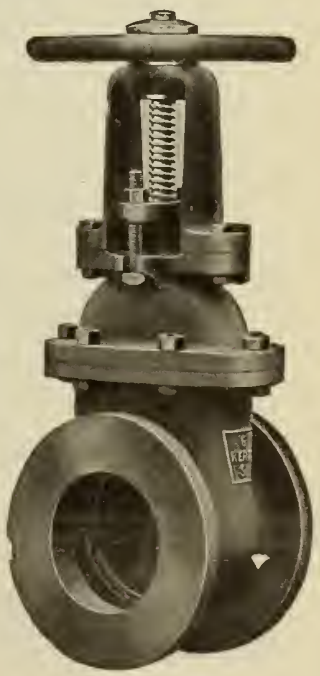
International Malleable Iron Co., Limited, Guelph, Ontario, Canada

There Are Lots of Gate Valves

Advertised and Sold

but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.

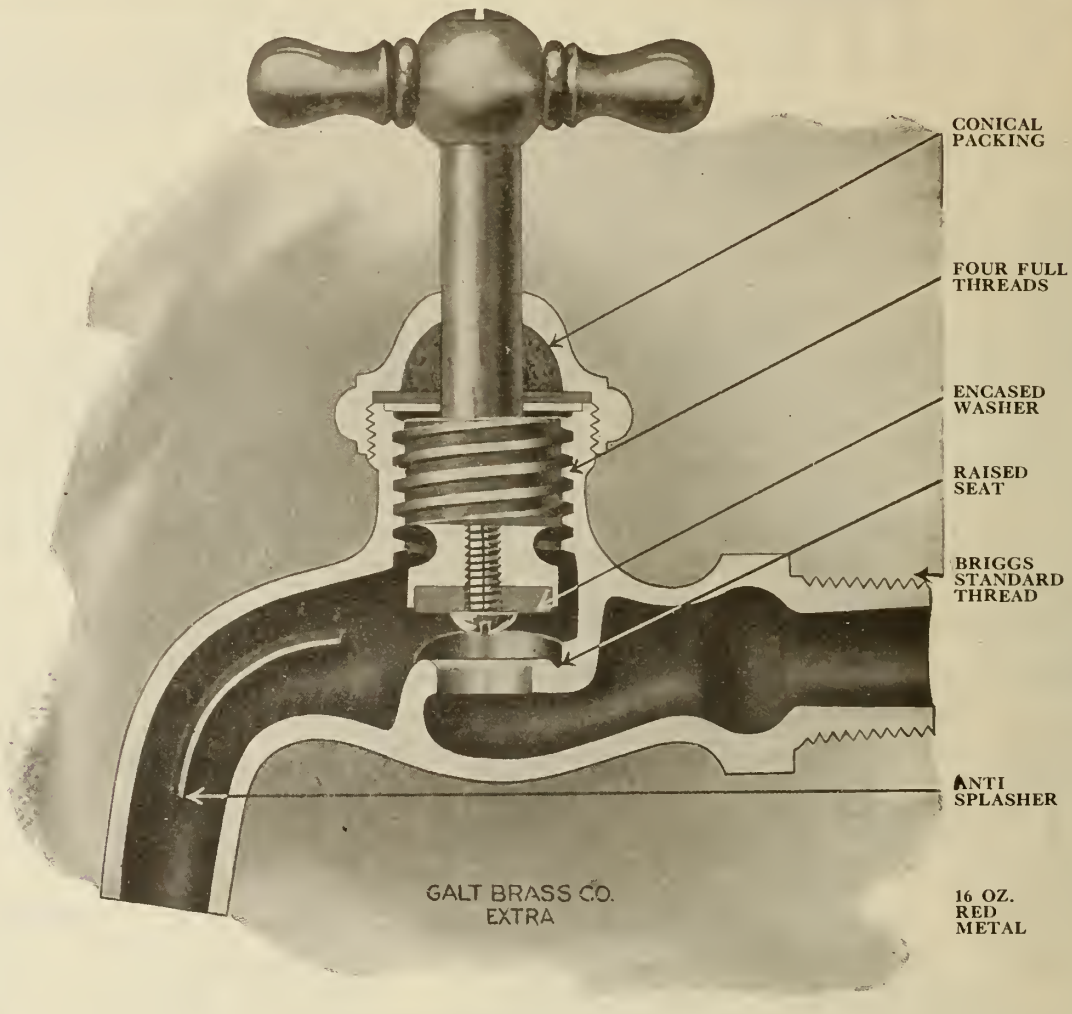
Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.

Approved by the Fire Underwriters' Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

Registered **PERFECTO** *Trade Mark*

This is a Steady Dependable Builder of New Business



A Famous and "Live" Guarantee

"Any article of our make proving defective through inferior metal, or improper workmanship on our part, will be replaced with *Two* good ones, at *No Charge* to you. You can't beat it."

Send us your order now

MADE IN CANADA

Galt Brass Company, Ltd.

GALT, ONT.

General Sales Office: 67 Adelaide St. East, Toronto, Ont.

Sanitary Engineer
Plumber and Steamfitter of Canada
VOL. XIII. PUBLICATION OFFICE, TORONTO, OCTOBER 15, 1919 No. 20

They Are Not Going To Be Denied The Shower Now

A 932—Nickel plated Shower with rain shower head, rubber tubing faucet connection and round curtain ring, with white duck curtain and wall hook.

THEY met it first in the training camps—it was part of their treatment in the convalescent hospital—it was included in the routine of the demobilization camps.

So the best of Canada's young men have become educated to the Shower—they know what it means to their health.

It is up to you to see that they get a Shower in their homes—the kind of shower that will give satisfaction—an EMPIRE SHOWER.

Let them know that you can supply the Portable Shower illustrated here.

It is specially adapted for use when a permanent shower is not practicable in a rented house, an apartment, or other places where space is limited. It is all that a shower should be.

Empire Permanent Showers in the latest and improved designs will be in demand as well.

You are going to be called on for Shower estimates.

Write for our catalogue and order direct from us.

Empire Manufacturing Co., Limited

London Toronto
Canada

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While

A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for BEAVER BRAND CAST IRON ENAMEL WARE

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

ONTARIO:
Monarch Brass Mfg. Co., 71 Brown St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes, 120 Lombard St., Winnipeg

We're Looking For Trouble

Tell us your troubles—anything that has to do with leaky hot water boilers and steam heating boilers. We specialize in *stopping leaks*. Satisfaction guaranteed and the advice costs you nothing.

Twenty-five years in the Neverleak business has fitted us to help you. Our *$1,000,000.00 Guarantee* means you can place perfect confidence in us.

Our sensational stop-leak preparation

BOILER NEVERLEAK

will solve many of your problems. You can easily *make $50.00 in one hour's time.* All you need is a wrench and a can of Boiler Neverleak to stop the most baffling leak.

If you haven't given Boiler Neverleak a trial, you will be surprised how it will help you on many a difficult job, save delay, save a lot of back-breaking work, make a *permanent, positive repair,* often in one hour's time.

There's only one Boiler Neverleak. We defy competition. Exhaustive tests have proved its real worth. Money back if not satisfied.

Tell us your troubles. You place yourself under no obligations.

BUFFALO SPECIALTY CO.

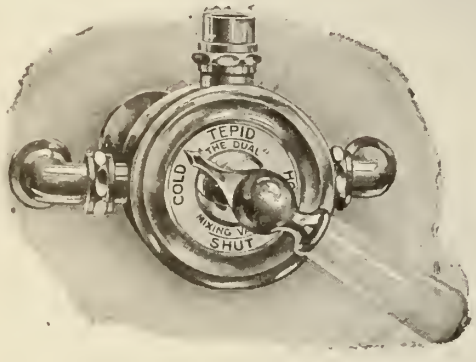
352 ELLICOTT ST. - - - BUFFALO, N.Y.

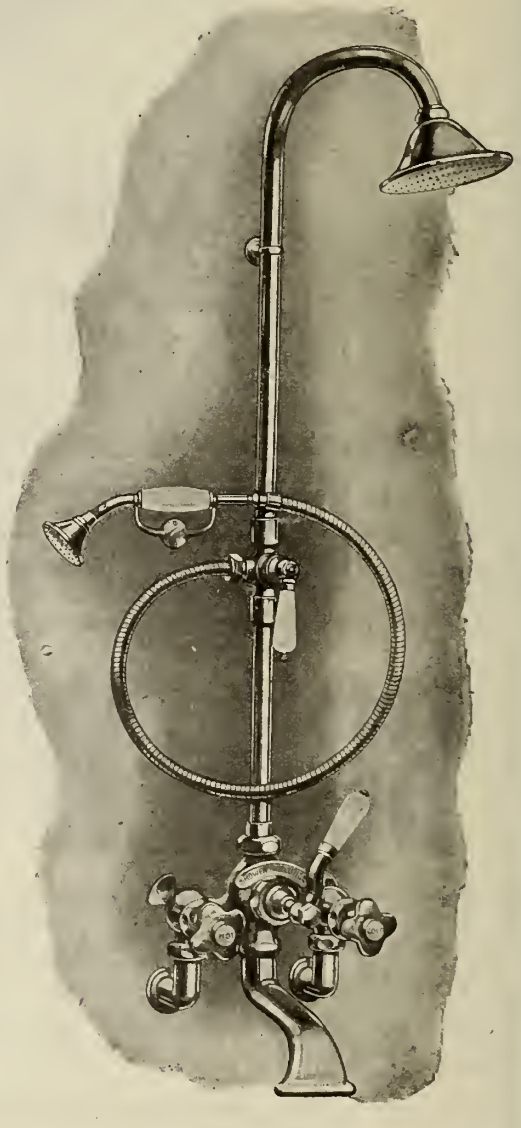
SANITARY ENGINEER, October 15, 1919, Vol. XIII., No. 20. Published 1st and 15th of every month at 143-153 University Ave., Toronto, by The MacLean Publishing Co., Ltd. Yearly subscription price, Canada, $1.00; United States, $1.50; Great Britain and the Colonies, 4s. 6d.; elsewhere, $2.00. Entered as second-class matter at the Post Office Department, Ottawa. Entered as second-class matter July 1st, 1912, at the Post Office at Buffalo under the Act of March 3rd, 1879.

G. & W. G. GUMMER, LIMITED

EFFINGHAM BRASS WORKS, ROTHERHAM, ENGLAND

And at
9 Fenchurch St.,
London





"Dual" Mixer

A valve that really mixes Hot and Cold Water, and maintains a uniform mixture.

For ease of operation, simple construction and easy installation, it has set a new standard of efficiency.

Cold Water must be turned on first, no possibility of scalding.

Made in several forms for Showers, Sprays, Operating Rooms, etc.

At the well-known works of Messrs. Brunner, Mond & Co. these valves provide baths for 2,500 employees.

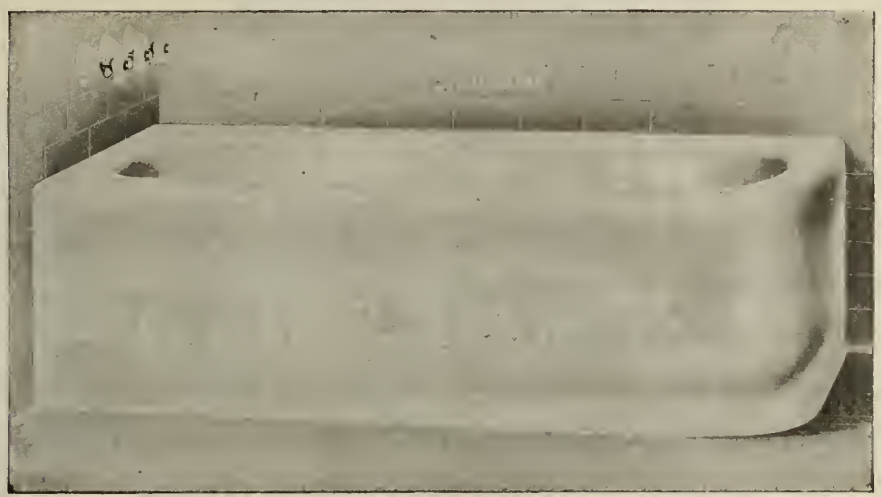
G. & W. G. GUMMER, LIMITED

Manufacturers of every description of

Engineers,' Plumbers' and Sanitary Quality Brassware

"Standard"
"Perfection" Built-in Baths

Made in One Piece Enamelled All Over



These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in-Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners meaning bathroom sanitation.

Made in 5 and 5½ foot sizes.

Illustrations on request.

Write the nearest dealer

Standard Sanitary Mfg. Co.
Limited

General Office and Factory: Royce and Lansdowne Aves., Toronto, Ontario

Toronto Store:
55-59 Richmond Street East

Winnipeg Showrooms:
76 Lombard Street

Hamilton Store:
20-28 Jackson Street West

Montreal:
358 Beaver Hall Square

Calgary:
325 Eighth Avenue West

Vancouver:
847 Beatty Street

"MADE IN CANADA"

AMBITION

A Little "Straight Talk" To the Canadian Plumbing Trade

Let us NOT "fling away ambition" but make our ambitions worthy ones.

Our chief hope and desire in the present series of advertisements is to influence the Canadian plumber to establish high ideals, to realize his opportunities and place his profession and himself on a high plane in the life of the community. Fortunately this ambition is being realized more and more in Canada and in many towns and cities the plumbing establishment ranks very high in business circles.

The Canadian Brass Company endeavors to contribute for the assistance of the trade goods of high quality and to render the trade every possible service which will make for better conditions in all its branches. The TRADE MARKS of this Company are an assurance that the goods bearing them are manufactured with the purpose of backing the plumber in his ambition to install the best possible work.

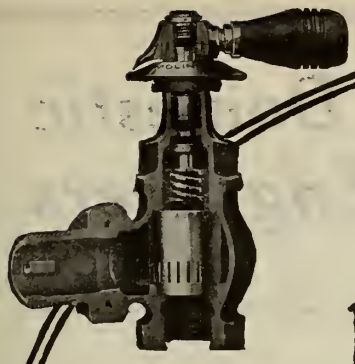
Our service department is always ready to suggest ways and means and we will esteem it a compliment when our many friends in the trade consult us when desirous of securing the best aids to the attainment of high standards.

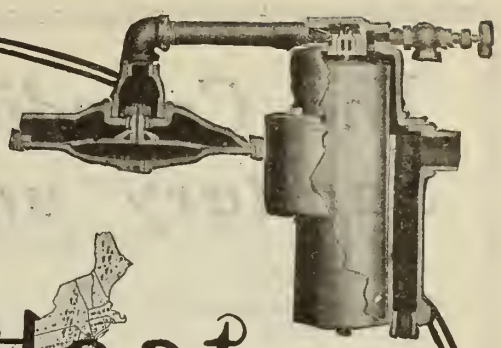
TRADE B.O.T. MARK

THE CANADIAN BRASS CO., LIMITED

GALT - - ONTARIO

CANADIAN BRASS GALT ONT

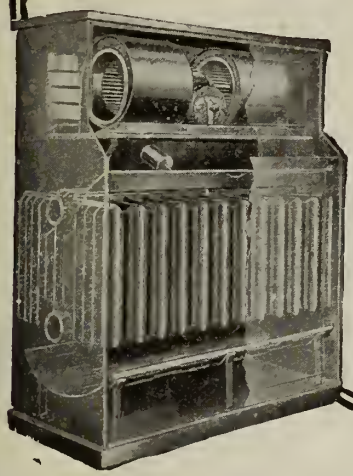




A GOOD LINE
of Equipment for
YOU to sell—

Moline Heat

EVERYWHERE



Moline Heat — System of Steam Circulation and Control

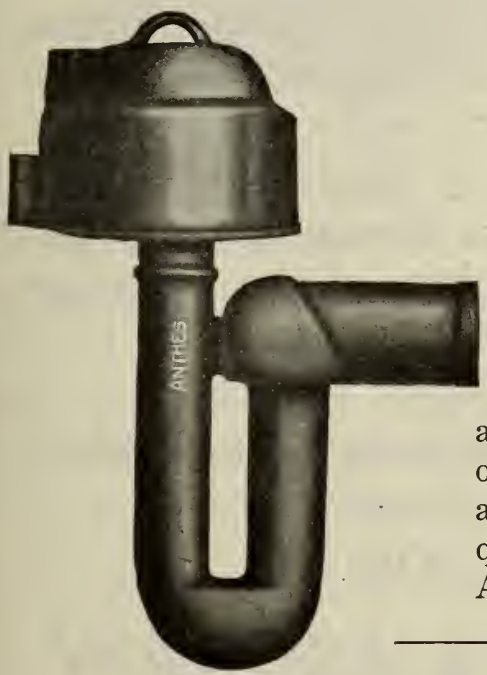
UNIVENT — Last Word in Combined Heating and Ventilating

Liberty Draft Controller — and other products

Write for Complete Line of Catalogs TODAY

Address Dept. G

MOLINE HEAT
Moline, Ill.



Choose a Syphon That Insures Success

ANTHES SYPHONS

are that kind. Seamless, made in one piece and operating purely on natural laws, Anthes Syphons are dependable and satisfactory. They embody the qualities that insure the success of your work. Anthes Syphons are the heart of the system.

Anthes Foundry Co., Limited
TORONTO and WINNIPEG

The Canadian Society of Domestic Sanitary and Heating Engineers

PRESIDENT
Frank R. Maxwell
TORONTO

VICE-PRES.
Harry Mahoney
GUELPH

SEC.-TREAS.
Garrett F. Frankland
TORONTO

ARE YOU SATISFIED?

Do the prevailing conditions in the Plumbing and Heating business satisfy you?

What are you doing to improve your situation?

Take stock of your affairs and where do you find yourself?

If the majority of those carrying on in the Plumbing and Heating business throughout Canada will answer the above questions honestly to themselves, they will admit themselves business failures.

If this is the case, something should happen quick.

SOMETHING HAS TO HAPPEN QUICK, and now is the right time for it to happen.

All those operating in the Plumbing and Heating business throughout Canada have opportunity knocking at their door to share in the prosperous times in view for Canada.

But they must open the door, by joining hands with the progressive Sanitary and Heating Engineers throughout the Dominion of Canada, by becoming members of the Canadian Society of Domestic, Sanitary and Heating Engineers.

Answer the above for yourself.

You lend a hand to improve trade conditions by forwarding your name and address to the secretary at once.

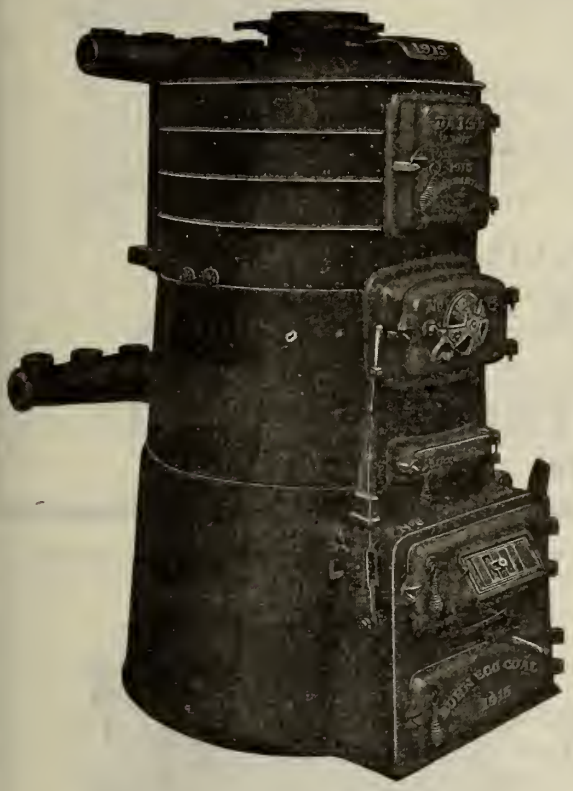
ALL FOR ONE and ONE FOR ALL

Yours for Co-operation

Frank R. Maxwell
President

Address all Communications to
GARRETT F. FRANKLAND, Sec.-Treas.
Room 303, 22 College St., Toronto, Ont.

Over 60,000 Daisy Hot Water Boilers Now in Use---Are You Selling Your Share?



Every Daisy Sale Means More Business

Daisy Boiler No. 5

Daisy Hot Water Boilers have stood the test of satisfying the public over fifty years. In buying and installing the Daisy Boiler you are not experimenting.

Daisy Boilers are supplied in 22 sizes that will handle from 167 to 4,000 feet of radiation.

They sell easily on their reputation and they pay you.

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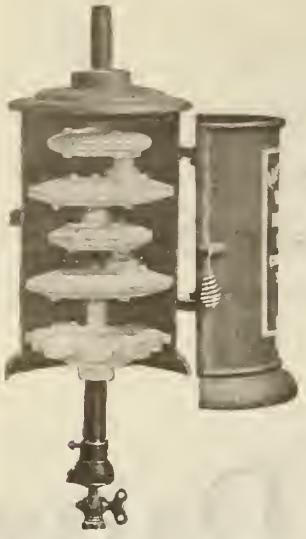

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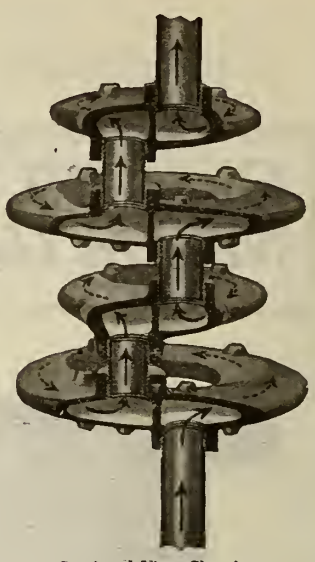

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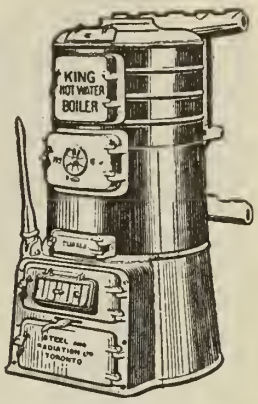

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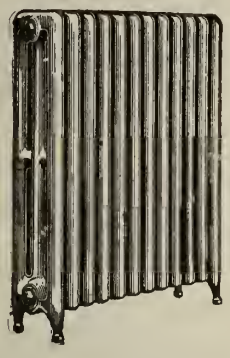

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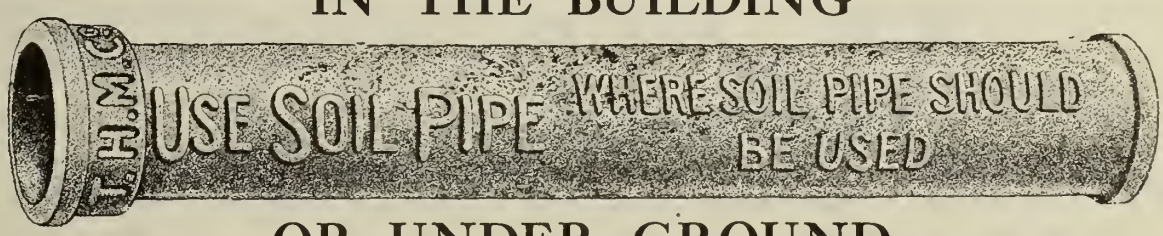

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Is the Alien a Menace?

IN the October issue of MACLEAN'S MAGAZINE a strong presentation is made of the reason why the people of the West are against further foreign immigration.

"The Menace of the Alien" depicts the foreign problem in the Canadian West as it exists to-day, and shows every one of us why we must Canadianize our Ruthenians, Austrians, Slovaks, and our fifty-seven other varieties before we allow any further "unrestricted" immigration.

This article is written by a member of MACLEAN'S MAGAZINE staff who has just returned from a careful, personal investigation of the situation. Shall we have a "White West?" Many Westerners are demanding it. Are the aliens to swing labor into the bosom of the O.B.U.? It is being done—and what must we do to stop it?

The "inside" story of the routing of the Drumheller miner aliens by returned Canadian war veterans is here told by MACLEAN'S for the first time. What leadership must be substituted for the O.B.U. leadership of these foreigners?

The October issue of MACLEAN'S is a Western number in the sense that it contains many articles and stories of distinctly Western interest. For instance:

X "Those Pesky Farmers Out West"

By Hopkins Moorhouse, author of "Deep Furrows"

They have completely upset the old order of things. No longer will politics consist of the comfortable fight between the Ins and Outs with the old party lines maintained. The grain growers on the Prairies have upset the calculations of the professional politicians and completely changed the face of Dominion politics.

X "Fifty Years in the West"

By Professor W. T. Allison

A breezy and readable sketch of the business career of Winnipeg's veteran business man, James H. Ashdown.

"Further Discoveries of New Lands"

By Vilhjalmur Stefansson

The final and most interesting instalment of Mr. Stefansson's story of his wonderful trip of five years' duration in the Canadian north in which he tells for the first time of finding new continents in the Arctic and hoisting there the Canadian flag.

X "The Banshee Bell"

By Edith G. Bayne

A bright love story laid in the mountains of British Columbia.

Other Splendid Features of October MacLean's

X "The Turmoil at Ottawa"

By J. K. Munro

A comprehensive survey of Dominion politics, written with complete impartiality and absolute candor. It is bright and breezy, with a knock in every line for the politicial opportunists. It plucks many tail feathers from our party leaders.

"Spanish Doubloons"

By Camilla Kenyon

The start of a bright and fascinating serial story by a brilliant young writer. It is the Spanish Main brought up-to-date, treasure hunting with a background of fun and romance.

"The Airy Prince"

By Arthur Beverley Baxter

A complete novelette in which is presented a bird's-eye view of England in time of war. It is one of the most brilliant stories that has been written of recent years.

"His Majesty's Well-Beloved"

By Baroness Orczy

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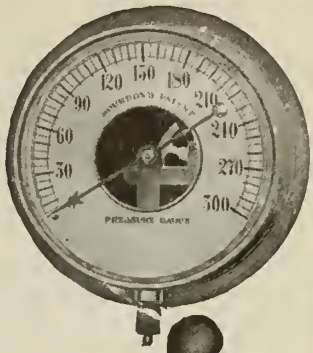

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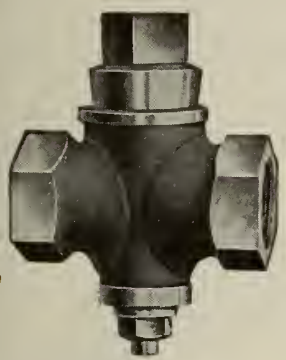

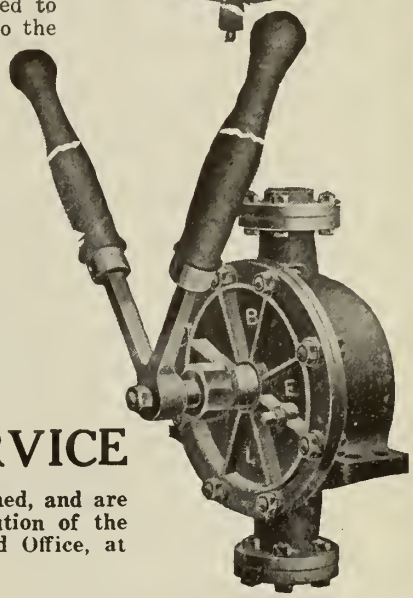

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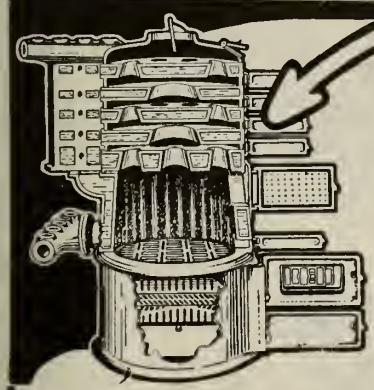

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SANITARY ENGINEER

PLUMBER AND STEAMFITTER OF CANADA

ESTABLISHED 1907 — PUBLISHED TWICE MONTHLY

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CONTENTS

The Heating of the Small House	15-16
Making Camp Sanitary For Soldiers	17-18-19
Prosperous Towns Mean a Prosperous Canada	20
Quality Work Has Built His Success	21
Plumbers Must Pass Examinations	22-23
What Causes Rate of Exchange	24
What Others in the Trade Are Doing	25
Editorial Comment	26-27
News From Here and There	33
Heating and Ventilating the Modern School	32
The Transportation Outlook	28-29-30-31
Sharp Order From Ontario Railway Board	34
Dominion Council of Health Meeting	35
Market Conditions and Tendencies	36-37

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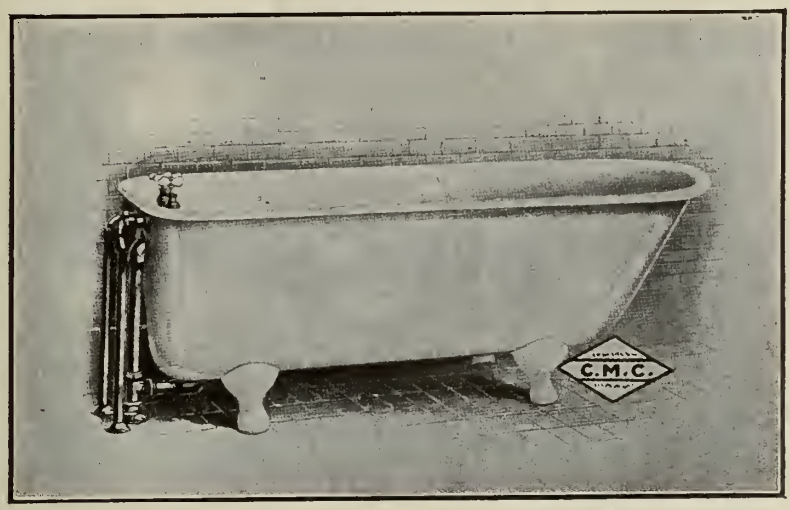

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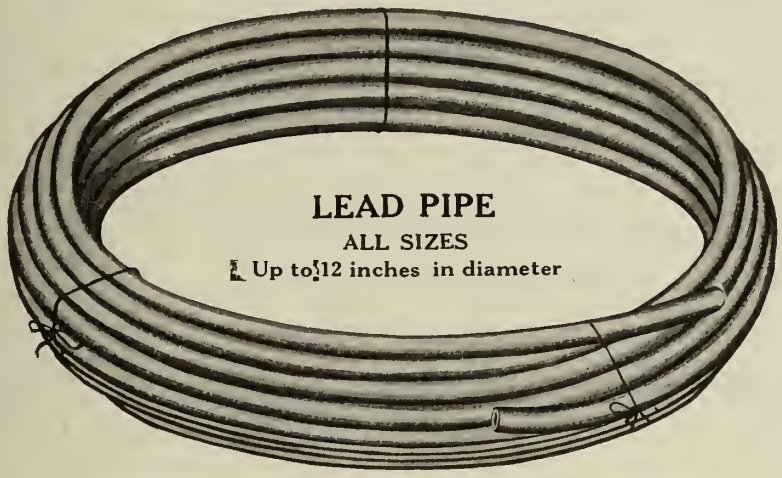

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Published First and Fifteenth of Month

Vol. XIII. TORONTO, OCTOBER 15, 1919 No. 20

The Heating of the Small House

Practical Data Regarding the Essentials of a Most Important Problem Encountered by Every Man in the Trade—How to Get the Very Best Results—Fourteenth of the Series by N. A. Kearns

THE subject we have now for consideration is that of the heating of a small residence by a hot-water system.

The house is one uniform in design and construction with that of a number drawn for the Welland Housing Commission, and differs only from the houses erected in the type of heating plant that is to be used.

As a rule a house of this size is heated by a warm air apparatus, but in this case the owner has asked that his house be heated with water instead of warm air, so the problem placed before us is to design a hot-water heating system that will give the greatest service with little attention, and at a low cost of installation.

The Architectural Drawings

When we refer to the architectural drawings, we note that this house is to be built of frame with exterior walls of stucco and metal lath. The outside dimensions of the building are 21 ft. 8 in. by 26 ft., not including the verandah. The storey heights are 9 ft. for the ground floor and 8 ft. for the first floor.

We could draw the heating system directly on the architect's plans, but in doing so we could not show the layout of the heating system with as much clearness as we could when making a separate and distinct set of drawings for this purpose.

Making a Tracing

The best way to copy the floor plans is to trace them either on tracing cloth or on tracing paper. Tracing cloth costs more than paper, but as it will stand a great deal of hard usage and erasing before being destroyed, its use may prove economical in the matter of a draughtsman's time when compared to time wasted in the handling of tracing paper with the care required.

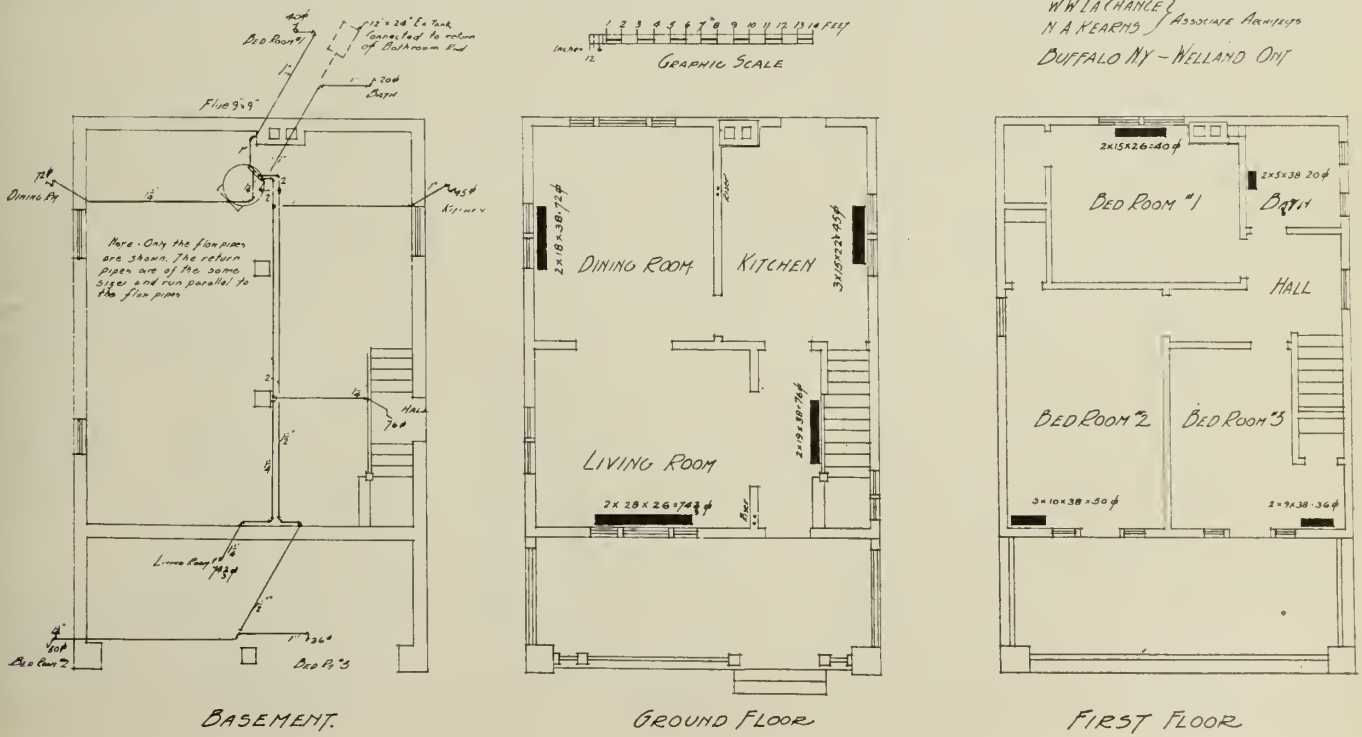
The tracings may be made in pencil or in ink. Blue prints may be made from pencilled drawings, but they are not so clear and distinct as those made from black "India" ink on tracing cloth.

When pencil work is to be done on the tracing, it is advisable to use the dull side of the cloth, as it is almost impossible to make a distinct pencil line on the glazed side.

Should be Dusted

Before attempting to draw with ink on the cloth, the cloth should be dusted all over the surface where ink is to be applied with powdered chalk. The chalk should be well rubbed in with a piece of chamois and then all of the surplus chalk should be dusted off the surface. The chalk removes all grease, etc., and permits the ink to flow from the ruling pen freely and in a uniform quantity.

We first carefully place the original drawings down on the draughting board and square the sheet to meet our set-square fair on the horizontal and vertical lines. Then over the drawings to be traced we place the tracing cloth, and after dusting the cloth with the chalk



as already described, we are ready to make our tracings.

All lines parallel to the bottom of the board are traced first. These lines are ruled along the upper edge of the T-square, then the lines perpendicular to the lines already drawn are ruled along the edge of the set-square. Last of all the diagonal lines are drawn.

What to Omit

In making a tracing off a plan for the purpose of showing the heating layout, do not draw in an extra line that may be left out. All extra lines only serve to confuse the man on the work. The main lines of the building must be drawn, as must also those indicative of the doors and windows. Any part of the construction that has a direct influence on the placing of the heating apparatus should be indicated, but all other lines must be omitted. It will be noticed that the main supporting beam under the ground floor is not shown on the plan of the basement, although the supporting posts are. If the beam had been shown, its lines would have become confused with the pipe lines.

To Figure Radiation

While the architectural drawings are still on the board we start to figure the radiation, and to do this have determined to use the heat loss method as a basis for our figures, and for our convenience may make use of the system presented in the April 15th number of the SANITARY ENGINEER. When we refer to the data there given we find that the heat loss formula for a temperature range of 80 degrees and a radiator efficiency of 155 B.t.u. per hour could be reduced to simple terms by a direct system of division of cubic contents and the exposed surfaces of walls and glass.

Thus we divide:
The cubic contents by 109.
The exposed wall by 7.6.
The exposed glass by 2.

And in adding the resulting figures find the total amount of radiations required for each room.

Radiation For Each Room

Starting at the dining room we find that this room is of the cube and the surfaces here given:

Cube: 11 ft. 4 in. × 13 ft. 8 in. × 9 ft. = 1,383 cu. ft.

Exposed wall: 11 ft. 4 in + 13 ft. 8 in. × 9 ft. = 225 sq. ft.

Windows: 1 ft. × 4 ft. × 4 ft. 6 in. = 18 sq. ft.; 1 × 6 ft. 6 in. × 3 ft. = 19 sq. ft.

Now we divide the cubic contents by 109 and find that for this we require 13 sq. ft. of radiation. This is only for one change of air per hour, and as in a room of this description we should allow for two changes of air in that time, we shall consider this as being 26 sq. ft. instead of 13.

Before we divide the wall surface by the factor given, the surface of the windows should be deducted, thus the wall surface is to be considered as 188 sq. ft., and after making the necessary calculation we find that there is 25 sq. ft. of radiation required to offset the heat loss occasioned by the wall.

Figuring for Windows

In figuring for windows and doors we assume that the entire area of the opening is of glass. This is to allow for the leakage around the casings, mullions and sash.

The window area of this room is 37 sq. ft., and, dividing these figures by the factor of 2, gives us 18 sq. ft. Fractions are ignored.

The total of 26, 25 and 18 sq. ft. is 69 sq. ft.

The other rooms are taken in turn thus:

Living room—
Cube: 1,372 cu. ft.
Exposed wall: 223 sq. ft.
Window: 47 sq. ft.
The radiation required for this room is found to be 78 sq. ft.

Hall—
Cube: 729 cu. ft.
Exposed wall: 166½ sq. ft.
1 door: 21 sq. ft.
1 window: 6 sq. ft.
The radiation required for this room is 51 sq. ft. In figuring radiation for an entrance hall like this, an allowance for three changes of air per hour must be made. In the upper hall two changes of air per hour is enough. The kitchen heating surface is based on a temperature of 60 deg. above zero and one air change per hour. Bedrooms are figured for one change of air per hour.

Locating the Radiation

In placing radiators in a room, the preference of the householder must be given some consideration. The most effective positions for radiation is under windows, but some people object to radiation there, sometimes on the ground of the higher cost of low radiators when compared with those of standard heights, and sometimes on other grounds.

The window in the dining room of this house is high enough from the floor to permit of the installation of a radiator 38 in. high, so we place a two-column radiator here of an area approximating that of our estimate of 69 sq. ft. A radiator must not be placed under the rear window because that space is reserved for an article of furniture.

The Living Room

The window in the living room is 30 in. from the floor, so here a 26 in. radiator is placed. A shorter radiator could be used if it was of the three column type instead of that of the two-column shown, but as the two-column radiator takes up less room for its width than does the three-column, and because in length it just about covers the window width, the two-column radiator is used.

The reader will note that there is more radiation indicated in the main hall than our estimate demands. The extra radiation shown here is to provide heat for the hall on the next floor.

Kitchen Radiator

The kitchen radiator is to come under the table at the edge of a sink. For that reason it is to be a low radiator.

The radiator in bedroom No. 1 is placed under a window not only because of its efficiency when so placed but also because there is no other space available.

Bedroom No. 2 has a radiator set in one corner. This radiator is of the three-column type and fits into that space to advantage.

The rad in the bathroom is set against an inside wall because all of the outer wall space is taken up with fixtures.

Locating Risers

After the radiators are drawn on the plans it becomes necessary to show where the pipes feeding these radiators are to be set. In a two-pipe system of hot water heating such as this, it is not necessary to show anything more than the feeding mains. The return pipes are of the same size as the feeds, and, as it is economical to run them in parallel lines, a system of single indication is all that is generally required.

Straight Across

The joists run straight across this building, so when the long lateral is run from the riser in the hall partition to the radiator in bedroom No. 2, no joists need be cut into. This same riser also feeds the radiator in bedroom No. 3.

All risers are concealed in partitions.

The riser that feeds the radiators in bedrooms Nos. 2 and 3 is not of an area equal to the combined areas of the two radiator toppings, but as the radiator in bedroom No. 2 could be served by a 1 in. topping, this riser will be quite large enough. Had that radiator been of an area of say 80 sq. ft., the 1½ riser would not be large enough.

In a future article it will be shown how much smaller pipe sizes can be used by properly proportioning the radiator toppings to the area of the radiator.

How To Reckon It

In the system here shown the pipe sizes are based entirely on the combined area of radiator toppings. In a small job of this kind no great saving will be effected by a different system.

The pipes connecting the boiler and the ground floor radiators are not connected to any of the first floor radiators, nor is the piping for the first floor radiators connected to any ground floor radiator. With a system like this there can be no danger of the rapid circulation through the radiators of the upper floors short circuiting the returns from the ground floor radiators. On a small job such a system of piping costs little, if any more, than that of a common main, and as it is so easy to instal we always advocate its use in work up to a certain number of radiators.

Requires Experience

A fitter who has had much experience in running common mains for radiators on floors of different levels may be able to so set and proportion his fittings that he can be satisfied of a perfectly uniform circulation resulting, but for most

(Continued on page 23)

Making Camp Sanitary for Soldiers

Fresh Changes of Clothing Available Every Ten Days—Making Bathing Conveniences For the Weary Fighters—Sanitary Closets — How a Montreal Plumber Did His Bit

TO a Montreal master plumber belongs the rather interesting and unique distinction of having served his king and country in Flanders, in a manner not altogether foreign to his own trade. This loyal individual was Captain Dan A. Bethune, head of the firm of D. A. Bethune, Limited, 483 Bleury street, Montreal.

Enlisting as a lieutenant with the Canadian forces, Mr. Bethune crossed to England and subsequently to France and Flanders. Here he was identified with the Third Division as Staff Officer of Details, and he was in charge of 125 men constantly for three and a half years. The particular effort of which he had charge, and in which he was able to do most creditable and important work, was that of erecting the baths, drying huts, etc., required by the division to which he was attached. A description of the details in simple language will doubtless be of interest to readers of SANITARY ENGINEER and for this data SANITARY ENGINEER is indebted to Captain Bethune.

The Bath House

One of the most carefully guarded things in connection with the modern army is that of the men's health. This is vital. It cannot be overlooked or in any way neglected. Such arrangements as are essential to the preservation of every man in the "pink of condition" are made quickly and unreservedly, regardless of the expense entailed. In fact the outlay should not be referred to as an expense, but rather as an investment. Without healthy fighting units, battles would be lost and the determination of great issues would be decided.

CAPT. D. A. BETHUNE

Of Montreal is a veteran, not only of his chosen vocation of Master Plumber, but of the great war as well. There he "carried on" for three years. As in connection with his own business, he is very modest regarding his exploits. He is held in high esteem by the Master Plumbers of Montreal.

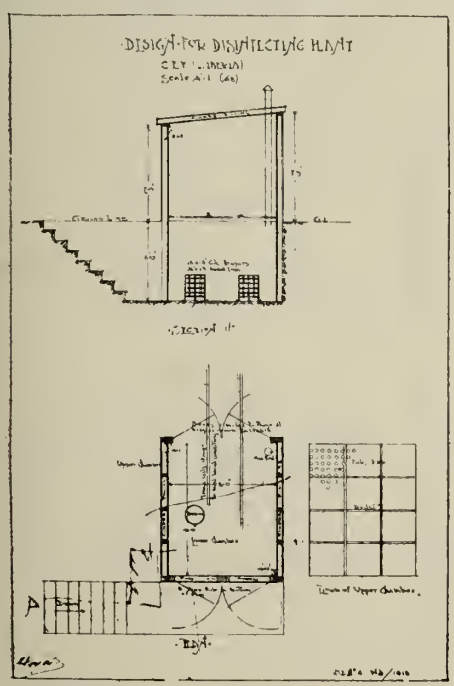
A Fixed Design

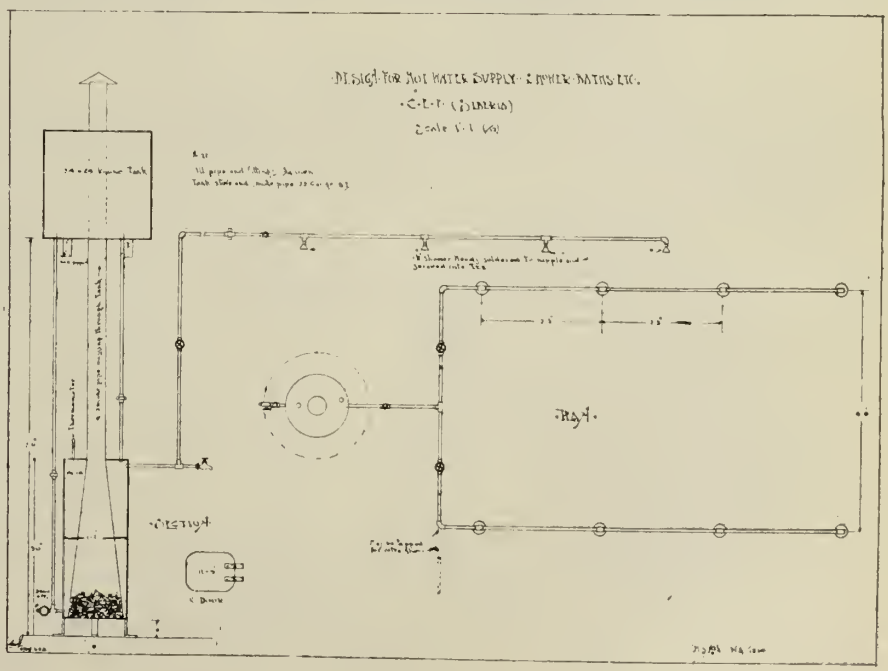
A fixed design of standard bath house was adopted by the military authorities which worked admirably in the field. This was of 23 feet width and in length the dimension was 36 feet. The roof was of the common gable pattern and the width of the building was planned with a view to making use, later, of seven-foot corrugated iron sheets. Two of these sheets, lapped, were sufficient to cover the width of 23 feet and to permit of a necessary extension over the side of six inches, and thus made a finished looking job and provided a good watershed.

In brief, the appointments of the bath house afford two compartments for clothing, one for soiled and one for cleaned. Reference to this in detail will be made later. There is also a private bathing compartment for officers and one for the men. The dressing room for the officers is 8 feet by 6 feet, and that for the men 16 feet by 7 feet 3 inches. Seats are provided, and a passageway of four feet is arranged. There are, of course, plenty of windows, and pegs for clothing.

The Water Supply

There is ample provision for a good water supply, and this is, of course, required in great quantity. The shower plan is necessarily adopted and the temperature of the water is made very comfortable through a unique arrangement of heating, which is known as the "dumb-bell shower bath," was used. If camp has been located near enough to a good river or stream, there is no need to look farther, but in the absence





of this natural asset wells must be bored. Incidentally, Captain Bethune stated that some very fine wells had been encountered with an endless supply of excellent water at all times.

The heat is introduced into the enlarged base of the smokestack which extends right through the centre of a 22 gauge galvanized iron tank 2 feet in diameter. This is the supply tank. The water passes in and against the base of this smoke pipe and the heat from the fire which has been lighted on the elevated grate at the base of the stack, and 4 inches above the ground, serves to warm the water quickly. It should be explained that a water jacket has been made to encircle the base of the smoke stack, and this, when made water-tight, permits a ready circulation of the water, and the same passes out to the pipe distributing system ready for use.

With five of these bath houses in each divisional area, forty men could be taking a bath at one time, aside from the officers who might wish to avail themselves of a shower. As many as 4,000 men sometimes took a shower bath in one day at one divisional quarters.

Filtering the Water

As it is imperative that the water passing out from the bath house be disposed of in such manner as to preclude the possibility of any disease spreading, a system of filtering is adopted.

The plan was not so elaborate, but it served the purpose well. This, after all, is the test of a sanitary measure.

From the bath house the water finds its way through a 3-inch pipe line and first enters a lime mixer. This is made from a barrel cut in two. From here the used water passes onward and is diverted, diagonally, to two settling tanks, each of which is 8 feet square. A baffle wall is fixed at one side, this to catch the solids, if there were any, although the water passing out from these showers would have a minimum of solid matter in it.

Passing through lime, sand, gravel, or cinders, it will be readily understood that any germ matter would be dealt with most effectively and disease-spread fully arrested.

No Joke This

Captain Bethune told the writer that there had been some serious accidents in connection with the movement of the mules and men over this pock-marked area, which, in places, had been a veritable hell during certain periods of the war.

In transporting certain material around the camp small two-wheeled carts are used, and to these are hitched the small but trusty mules. Much of this work, in the very nature of the risks, which would make it almost foolhardy in the daylight, must be undertaken at night. This involves the necessity of groping about in the dark more or less, and the is little opportunity to follow beaten roads or paths. As a consequence, Captain Bethune stated that cases had come to his notice where cart, mule and driver had toppled into these wells.

"How they ever got in I cannot understand," said the Captain. "The wells are only about four feet in diameter, and it did not seem possible for a cart to fit in there. But they went to the bottom, and, strange to say, they were not killed. Military crosses have been awarded for rescues made from these wells."

The Drying Apparatus

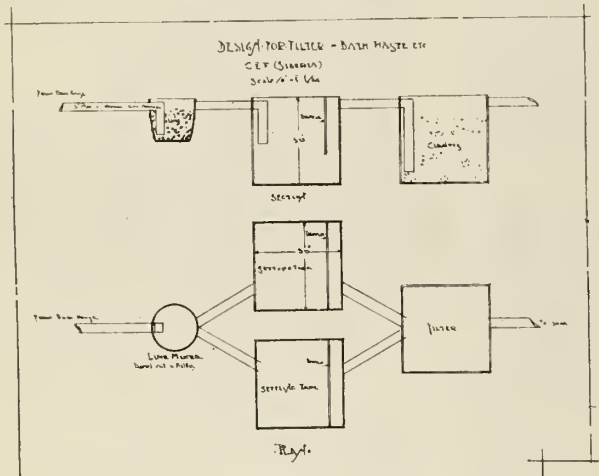
When a civilian bathes he immediately seeks a fresh change of wearing apparel. But even his appreciation of cleanliness cannot be as great as that of the soldier. Faced with dirt on every hand, he must come in contact with it, in the nature of his exploits from day to day, and what should be more natural, once his body is cleansed, but that he should have a clean change of wearables?

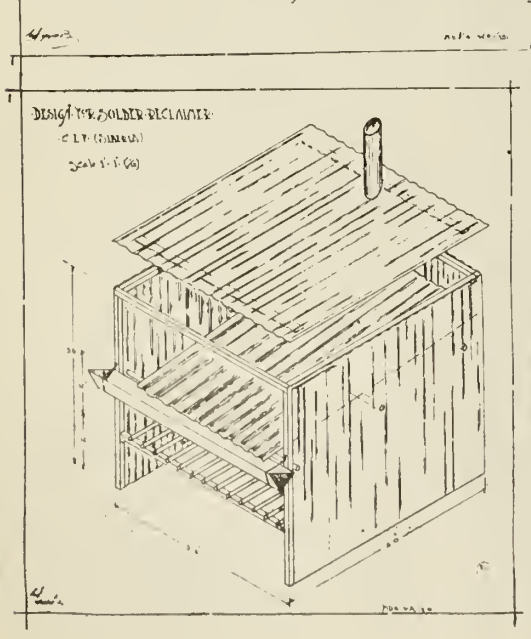
With a view to making necessary provision for cleansing the men's clothes, a separate building has been erected. This is of fifty foot length and six and a half foot width. The design is that of a shed or shanty and the appearance is much the same as that presented by a poultry house. The height above ground, at the front, is 7 ft. 6 in. and that at the rear is 6 ft. 6 in.

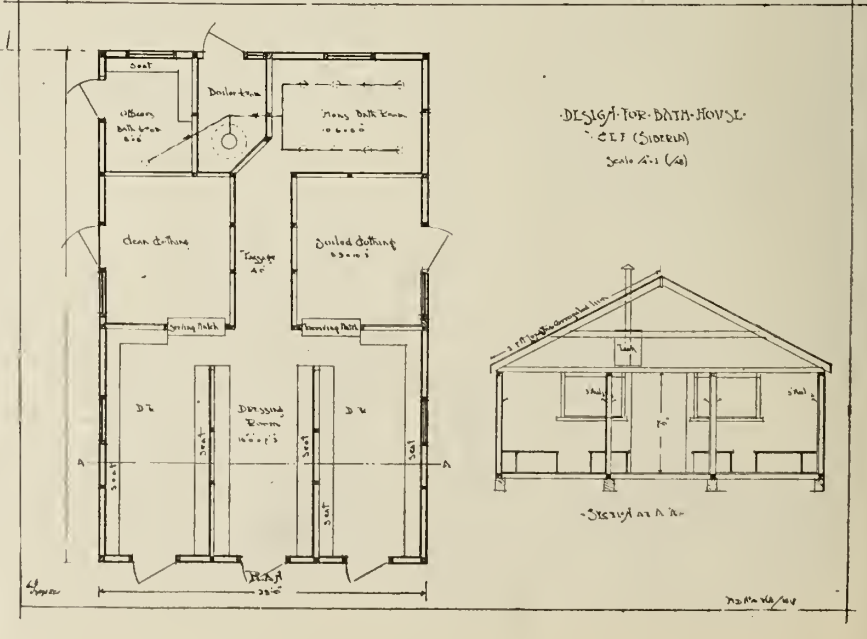
Inside the building is lined with corrugated galvanized iron and this is the material used on the exterior, also. Between this and the studding there is a filling of cinders. This helps retain the heat. It might be explained that there is also a double roof, the filling being similar to that used between the walls.

Heating Apparatus

The heating apparatus is quite simple. A small heating chamber is constructed of brick, three feet in depth, two feet high and five feet nine inches







wide. At a short distance above the ground, and between the two side walls of brick, a simple grate bar arrangement is provided to carry the fuel. The roof of this little chamber is of 4-inch pipes and these are 5 ft. 6 inches long. The space between is cement-filled.

Once the fire is started the smoke and heat passes through a 15-inch galvanized pipe, this being on studding just above the ground and the full length of the building. This great length affords a strong draught and the pipe passes out at the end farthest from the heating furnace, being carried through the roof a distance of three feet.

First Disinfected

Quite guiltless himself, the soldier may be the victim of his careless brother-in-arms, who has been none too careful to preserve his body and clothing free from vermin. Thus, the "wee things" try hard to get the upper hand and would succeed but for the precautions taken by the sanitary section of the big army.

As a general thing there are about 1,600 changes available from one disinfecting and drying plant every day. This means the issuance of no fewer than 8,400 pieces.

Discarding their clothes, which they have been wearing the allotted time, the soldiers' wearables pass into the disinfecting chamber at once.

This chamber is 8 ft. wide by 10 ft. long, and of the same shape and style as the drying chamber just described. The heat is supplied from below the ground line, an excavation having been made 6 feet deep.

The medium of generating heat is through the use of two braziers placed in the bottom of this excavation. These braziers are circular in shape, are 18 in. wide and 18 in. high and are constructed of ¼x1½ in. band iron. Holes 1½ in. in diameter are bored in the floor and permit the free passage of the disinfectant to the chamber above.

Load Distributed

Placed on trucks and which run on light rails, the load is distributed on a series of racks being provided for this truck. This truck load is then pushed into the disinfecting chamber and the thorough disinfecting is accomplished within twenty minutes.

The remaining operations are those of washing and then repairing and distributing. This washing and disinfecting is done once in ten days, that is, the men have a clean change every ten days. The operation of cleansing and repairing, of course, is continuous from day to day.

There are three plans of disinfecting. The first was that of a solution of 2½ per cent. creosote with hot water. Treatment of this kind lasted 20 minutes, and this was very effective and speedy.

Second Treatment

The second treatment was that of the same proportion of creosote, but cold water was used. This was much slower, the operation taking 24 hours. Ordinarily, this would constitute quite a loss of time.

The use of steam constituted the third plan. This steam was introduced into a small box of wood or metal and which was 4 feet in diameter. The clothes were placed in baskets and a steam pressure of five pounds was turned on. This lasted for 15 minutes and any "movies" subjected to this were quite dead at the finish.

Closet Arrangements

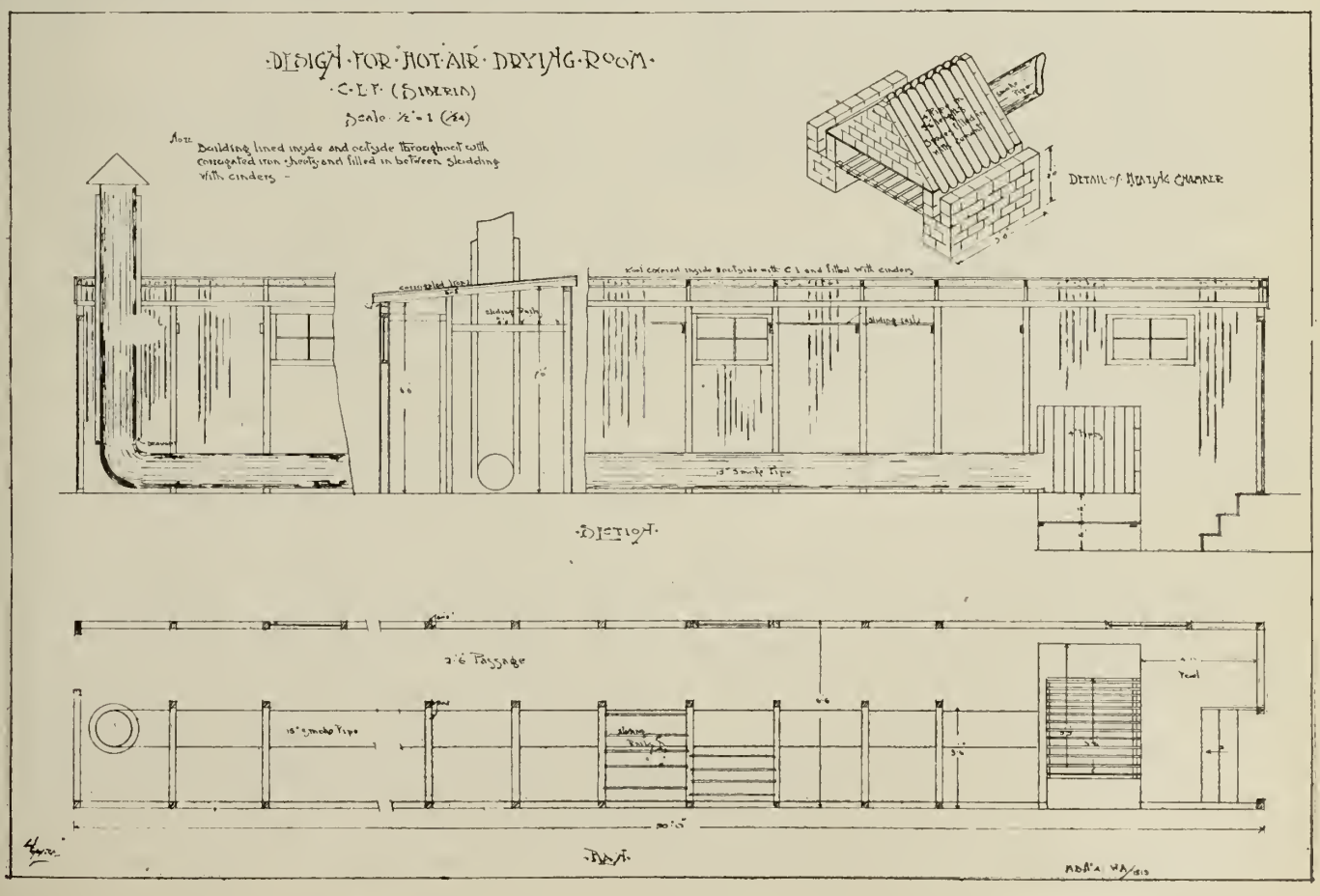
In making arrangements for closets, two plans are followed. In some instances a galvanized box plan is used. This works well and is quite satisfactory, but, of course, it cannot be used altogether as the number of boxes required would be numberless, almost.

The other plan is that of the pit arrangement. The pits are dug seven feet deep and recourse is had to chloride of lime, in order to combat the increase of flies. By exercising extreme care in this respect there has been little difficulty in caring for the sanitary requirements of the vast expeditionary forces, which, for four years, thronged France and Belgium.

Salving the Solder

The foregoing description will have given some idea as to the arrangements which modern war has called for in preserving to the men their health. For in no small measure the cleanliness of each unit is an index of its ultimate effectiveness in waging war.

Continued on page 23


DESIGN FOR HOT AIR DRYING ROOM
C.L.T. (DUBLIN)
Scale ½" = 1 (Ft)
Note Building lined inside and outside throughout with corrugated iron sheets and filled in between sheeting with cinders -
DETAIL OF BRAZIER CHAMBER
DESIGN
2'6 Passage
15" smoke Pipe

Prosperous Towns Mean a Prosperous Canada

By E. M. Trowern, Secretary, Dominion Executive Council, The Retail Merchants' Association of Canada, Ottawa

THERE are very few people in Canada who have not heard the argument used, that in order to pay our national debt we must produce more goods, whether they are from the forest, the mine, the field or the sea, The object is to exchange these goods for other goods that we require, but which we cannot produce. The more goods, therefore, that Canada can produce the richer she becomes, and the richer that she becomes the better business place it is for those who live here. If the above argument is sound for Canada as a whole it should also be sound for any part of Canada.

Makes for Progress

Competition among nations is the strongest incentive toward progress. The Canadian people are proud of Canada because of the ideals she has set up, and she is, therefore, proud of her flag and proud of her race. This is the incentive for higher development. To build up Canada we must do as all sane men would do in their own private business; they must build up their treasury, and so we must build up the Canadian Treasury. Hundreds of millions of dollars in the treasury of any foreign country are of no use to the Canadian Treasury unless we can get some of it by exchanging our products for it.

Would Become Dormant

If the world was one great commonwealth and there was only one treasury, we would become dormant through want of competition, and we would become lost through enormity. Competition is the mainspring that forces us on toward higher ideals. This is true in every position in life. The citizens of every city, if they are happy and contented, take a pride in their surroundings. They want their city to be the best in Canada, and they strive toward that end. This produces a healthy rivalry, and so it is with the towns and villages of Canada.

Variety and Style

Follow the argument a little further, and competition among the citizens for better homes produces a variety and style that lends a charm to life, and which could not be found where every house was built after the same plan and of the same style of architecture. If legitimate competition, therefore, is an advantageous incentive among nations, cities, towns, villages and individuals, it must be encouraged and not destroyed, providing it receives no special privileges and does not undertake to take advantage of its position.

Goes Hand in Hand

Wherever there is prosperity there is usually progress. Prosperity is not always represented in dollars and cents. If it were so and all the dollars and cents in Canada got into the hands of two people, no one could say that Canada's prosperity was impaired if the amount this year remained the same as last year, or was somewhat greater, but if this condition was produced we would begin to see evidences of lack of prosperity all around us.

How About This?

In making a survey of all the towns and villages throughout Canada, can anyone say that they see great evidences of prosperity? Can they see more stores being built or new additions to old ones? Is there more paint used than formerly on the store fronts? Are the stocks doubling up or keeping pace with the population? Is there a general appearance of prosperity all around? Are there more and better pavements, better fire-fighting appliances, more contented civic employees, better paid public school teachers, etc.? If not, why not? Could it be because of the lack of pride in the town or village? Is the money that is paid to the farmers or producers passing through the town or village and circulating so that all engaged therein can have an opportunity of being rewarded for their services, or is the money going direct to one or two large mail order houses hundreds of miles away, and starving the trade of the town?

Reduce Its Power

Take the actual trade and business out of a town and you reduce its power to pay taxes. Taxes can only be paid by those who have money to pay them. Mendicants and beggars never pay taxes. Every retail merchant who has a store in a town should make it a rigid rule to buy all the things he requires from his fellow retail merchants in the town. If the goods you want are not in stock, leave your order and encourage your fellow retail merchant to stock them. If retail merchants themselves patronize and encourage mail order catalogue houses, how can they complain if others do the same thing?

Keep It At Home

If you want your town to thrive you must keep your money in local circulation. You must constitute yourself a town booster. Canada's continued prosperity depends upon her live, up-to-date towns. It is far better to have eight million happy and contented people in Canada, all having enough work to keep them busy and sufficient salaries to enable them to lay something away for a rainy day, than it is to have thousands out of employment, thousands receiving starvation wages, thousands in the poor houses, and a few living in luxury and abundance. The more active, energetic towns that we have the more equitable will be the distribution of wealth.

Vital To Our Future

Canada's future depends upon the prosperity of her towns and villages. If the towns and villages of Canada decline, Canada will also decline. If you want your town to die, take your money out of circulation and send it away to a mail order house. If you want a thriving, up-to-date place where the people love to congregate, be a town booster; take an interest in the stores in your town; encourage those who keep clean, comfortable hotels, where commercial travellers can stay with comfort and obtain good meals. If you have a local paper, weekly or daily, subscribe to it, and if you are a merchant or a manufacturer advertise in it and see that the proprietor keeps everlastingly boosting your town. If it is worth living in it is worth boosting; if it is not worth living in we would advise you to move out as quickly as possible and give place to better men.

Quality Work is Basis of His Success

"I Will Not Cut Prices for Anybody," Says Alex. Henderson, of Thornhill, Who in Three Years Has Built Up a Business That Keeps Himself and Men Busy the Year Round

Based on an interview by C. E. PARSONS, of SANITARY ENGINEER, with ALEX. C. HENDERSON, of Thornhill, Ont.

THREE years ago Alex. C. Henderson left Toronto, where he had been in the plumbing business for seven years, to locate in Thornhill, Ontario, a village of 850, located ten miles north of Toronto. He had an idea that there was a lot of good business to be obtained among the farmers and he had his own ideas about how to obtain and hold that business.

"My whole business policy," said Mr. Henderson to SANITARY ENGINEER, "was based on quality work. I came out to Thornhill an unknown man, and started in to build up a business. I soon found that there was plenty of work, and now after three years I am in the position where I have not an idle moment the year round and have three men working for me."

Likes the Farmers

"The farmers are good people," said Mr. Henderson, "I have had no trouble with them. They are often hard buyers and have to be shown, but I have found that the whole situation centres around getting the farmer's confidence. Once he knows that you will do good work, and that you will not allow any poor materials to be used on the job, in short when he knows he can thoroughly trust you, there is no better man to do business with. They have the money and they want good goods and they are willing to pay fair prices for them. I have never had any trouble with collections. In the three years that I have been here I have only lost $21 and that was my own fault."

Sells Water Systems

Mr. Henderson has had splendid success in the sale of water systems. Each season he finds the number of installations of these systems increasing. Next year, he says, he knows he will instal more water systems than he did this year; just as he put in more this season than he did a year ago.

"They sell themselves," said Mr. Henderson. "It is a question of getting a good system and then installing it right. One thing I insist upon absolutely is in satisfaction. My customers have got to have good goods and good workmanship. I want to be satisfied as far as my own conscience is concerned that no poor material went into a job and that there was no faulty workmanship. I am building for the future and this foundation is the only sure one to build on. I have proved it right along.

His Best Advertisement

"The people for whom I have done work are without any question my very best advertisement. I have tried in every way I can to give them good value for their money. I hold, and I think rightly so, that a man is entitled to a fair profit on his work. I figure on twenty per cent. I can do this because my overhead in Thornhill is lower than it would be in a large city. If I were in a bigger place I think 25 per cent. at least would be necessary.

Won't Cut Prices

"I will not cut my prices for any man. When I give him an estimate of a job, it is made after carefully investigating all the requirements. I will use no cheap materials, and the workmanship must be such that it will pass my standard. That means that it must be right. There must be no comebacks. Here is an example of what I mean. A man came to me early in the season and wanted a figure on a job. I gave him an estimate of $350. In a few days he came to me and told me that my price was $70 too high. I asked him what he meant, and he said that he could get it done for $70 less, that my price was too high. I told him he was absolutely wrong. My price was not too high. It was a fair and honest price based absolutely on the cost of the time and labor, with prices for good materials added and a fair allowance added for profit. I told him that I could not undertake to use materials that would allow me to do the job for $70 less because if I did, the people who bought the house would in a short time have trouble and they would never stop telling everybody in the neighborhood that 'Henderson did our plumbing work and he is to blame for all the trouble we are having.' That is the worst kind of advertising I could have and I do not want any of it. I would rather let some other fellow do the work and get talked about the wrong way if he does bad work."

Improve Their Homes

Mr. Henderson says that the farmers are continually improving their homes and that they want the conveniences and things that city people have. There is a big field in supplying these things, he says, and it is a question of getting started.

"Every installation I make," he says, "means just that much more business in the future. If I put in a pressure water system or bath room equipment for some farmer and it works out ten times better than he even expected it was going to, and that is what happens, he never tires talking about it and telling his friends and showing them what a convenience it is. The first thing I know one or more of his friends is around wanting to know how much the equipment I put in Mr. So and So's house cost. He tells me that Mr. So and So recommended me and my work, and said that I did a good job for him and used good material and he has had no trouble. That is the way I want them to talk and that is the way they have been coming ever since I started work. The best part of it is that they are coming in constantly larger numbers and as I said I have not had an idle period in the whole twelve months. I insist on my men doing good work and we are all kept very busy. I have enough work ahead now to keep me working at full time away on into the spring."

Blames Manufacturers

Mr. Henderson blames the manufacturers for promising to send out materials and then not keeping their word. If they would set a time for delivery, he says, even if it was a month ahead and then make good, it would enable him to plan his work and keep his men employed to the best advantage.

"I have a case right now," he said. "A firm has been promising me material for three weeks. Every two or three days they tell me it will be there sure. It isn't here yet, and it just means that I am not going to buy any more stuff from those people. They do not realize what it means to disappoint me in delivery like this. It puts me in wrong with the man for whom I am doing the work. He wants to get into his house before the cold weather comes and he blames me for the hold-up. It keeps my men waiting about, and men at present wages when they stand around soon count into money. If I knew the stuff was not coming, I could send them to some other job, but when the firm assures me the material will be there at such a time and the men go and do not get it it means a lot of trouble and loss."

What They Buy

Reverting to the farmers again, Mr. Henderson explained the course followed by the average farmer.

"When a man begins to get money coming in plentifully," he said, "the very first thing he wants to buy is an automobile. The next thing he thinks about making his home a more comfortable place to live. He begins to find out about better heating, better conveniences and so on. My experience is that it is not a question of price with most of these men. They want good goods and installations that are not going to give them trouble. They want things that are going to make life easier for them and their homes better places to live in. Many men in business perhaps do not realize how people talk. People are talking all the time about a store, or a plumber or somebody. If they are well treated and satisfied they never stop boosting, and if they are not satisfied they never stop knocking. One bad piece of work would do more to ruin my reputation than a dozen good

Continued on page 23

Plumbers Must Pass Examinations

Sanitary Engineer Subscriber in New Zealand Sends in Examination Papers—About 45 Per Cent. Successful in Passing — Licenses Needed and Renewable Yearly

Editor's Note.—Through the courtesy of one of our subscribers, W. S. Fisher, 135 Dominion Road, Mt. Eden, Auckland, New Zealand, we are reproducing papers used in connection with an examination in plumbing, conducted under the supervision of the Plumbers' Board, of New Zealand, and at which Mr. Fisher acted as one of the assistant supervisors. In New Zealand there is a Plumbers' Registration Act, which compels every man to pass an examination before he can engage in sanitary engineering. After passing the examination the plumber receives a Government license which is renewable yearly. Apprentices are also required to take a course in the technical school. Mr. Fisher advises us that in the examination here presented, about 45 per cent. successfully passed the examination. The accompanying drawings are obviously in greatly reduced size, but will serve to show how the questions are placed before those trying the examination.

UNDER the Plumbers' Registration Act of 1912, all those engaged in the plumbing trade in New Zealand must have passed a successful examination, and must also hold a license which is renewable yearly. The examination held on July 4 is herewith presented in detail. About 45 per cent. of the contestants were successful. The plans used in the examination are shown in greatly reduced size, and the instructions and questions were as follows:—

The Plumbers' Registration Act, 1912
(Plumbers' Board of New Zealand)

EXAMINATION IN PLUMBING

Written Examination, 4th July, 1919
Time allowed: 7 p.m. to 10 p.m.

NOTE.—**Any candidate who answers more than five questions will be disqualified.** Every candidate **must attempt** question No. 2. Candidates must use Plan A when answering question No. 2, and use Plan B if answering question No. 5. The maximum number of marks awarded to each question is the same.

1. Describe the materials and method necessary for adding a new branch to a galvanized sheet-iron vent-pipe already fixed.

2. (Compulsory). Show by single lines in Plan A a drainage system to connect the fittings with the sewer. Mark the names of the various vent-pipes and traps of the drains.

3. (a) What is the composition of good wiping solder?
(b) What are its characteristics?
(c) How may it become unworkable?
(d) How would you test its quality?
(e) How would you cleanse it?

4. Neatly sketch in section and describe how you would flash 4 in. cast-iron vent-pipes passing through rods covered with the following materials:—
(a) Ruberoid.
(b) Lead flat.
(c) Galvanized corrugated iron.
(d) Tiles.

5. In Plan B fill in single lines to show a first-class hot-water system to the fittings shown therein. Specify details of

The Plumbers' Registration Act, 1912.
Time Allowed: 8 a.m. to 12 noon, and 1 to 5 p.m.
5th July, 1919.

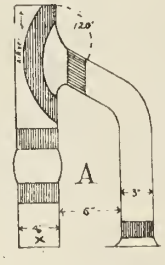
INSTRUCTIONS

All inquiries for information to be addressed to the Supervisors.

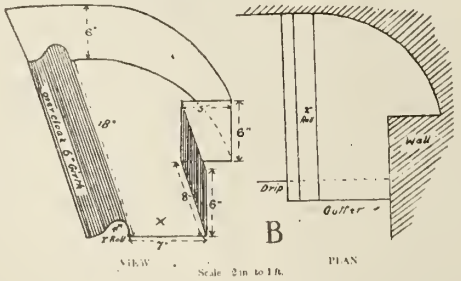
Candidates are not permitted to communicate with each other, nor to assist each other in the work they have to do.

Though the proper execution of the work is of the greatest importance, the time spent on each piece of work will be considered in judging its merits. Candidates need not, however, hurry over their work. Accuracy is required.

Each candidate must see that his number is stamped upon each piece of material, at the point marked X on sketches, before commencing if he so desire, but without fail **immediately after completion** of the work, so that the time spent upon it may be recorded.



A.—Cut 8 in. of 4 in. pipe from 2 ft. piece and wipe together with underhand joint. Bend 2 ft. piece of 3 in. pipe and join and wipe flange and branch joints in upright position as shown. Use spare lead for flange.



SIDE PLAN
Scale 2 in. to 1 ft.

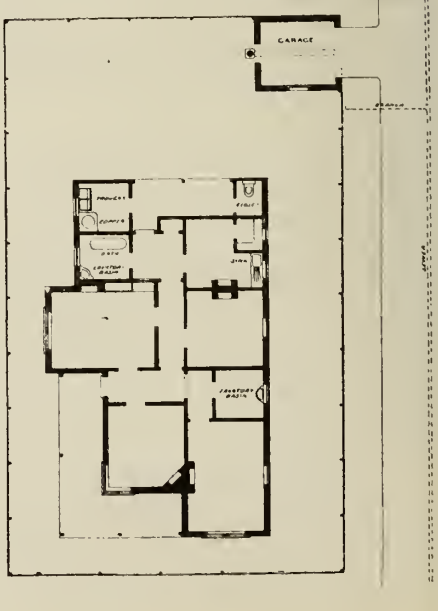
B Bend up 2 ft. by 2 ft. of sheet lead to dimensions shown in view and plan

PLUMBERS' BOARD OF NEW ZEALAND

PLAN A

Examination in Plumbing

Written Examination, July 4th. 1919
To be used with Question No. 2.



the materials, sizes of pipes, and capacities of boiler cylinder and cistern.

6. State particulars of the precautions you would take in constructing a vertical main stack of cast-iron vent-pipe (which receives branch vent-pipes at several floors) to prevent its lower part becoming choked with rust scale.

Also make a sketch showing this feature of construction.

The foregoing will undoubtedly prove of great interest to many members of the craft in Canada, and will show what brother members of the craft are doing in other parts of the world.

In a letter to SANITARY ENGINEER, Mr. Fisher states that business is brisk in New Zealand and that there is a great shortage of houses. Mr. Fisher states that many people held back for a long time expecting a drop in price, and absolute necessity has forced them to go ahead with building operations. Referring to prices, Mr. Fisher states that corrugated iron and galvanized flat sheets, used largely for roofing in New Zealand, is $250 a ton, as against a pre-war price of $90. Other lines are up 60 to 200 per cent. A six-room house that could be built for $3,000 in pre-war days now costs at least $4,500.

QUALITY WORK IS BASIS OF SUCCESS

Continued from page 21

jobs, and my plan is to leave no bad work behind at any time to advertise me the wrong way."

Keeps Close Track

Mr. Henderson does all his own bookkeeping, and says that keeping track of everything is of inestimable value to him.

"By going through my books I can tell you in a few minutes," he said, "exactly how much I have sold, how much is owing me, how much I owe and how much I have in the bank, and many other things that it is important for a man to know.

"I have had little trouble with collections. The farmers I find are honest and they have the money to pay for what they get and they pay. I do not do any credit business. I find out that the men I am going to work for are all right before I take a job and then go ahead."

Keeps An Auto

Mr. Henderson finds his field of operations continually widening. In order to cover a radius of several miles around Thornhill he invested in a car so that he can get around quickly. It was, he says, a splendid investment and he can cover quickly and at a minimum of expense an area that he could not begin to reach in any other way.

Mr. Henderson's policy in regard to repair work is never to try to fix any part that is not worth fixing.

"If I find after examining a piece," he said, "that it is worn out and that a new one would be the only means of making for permanent satisfaction, I refuse to fix the part. If I charged a customer up with repairs for some piece and then in a couple of weeks or a month it broke some other place, as it is sure to do, the customer would kick and he would have good grounds for complaining. If I explain to him that a new part will cost very little more and that it will make a job that will last for years perhaps, he usually sees the point and buys the new one. If he does not I refuse to take the work and let someone else get into trouble."

Apprentice Problem

Mr. Henderson thinks that the apprentice problem is one of the greatest in the trade to-day.

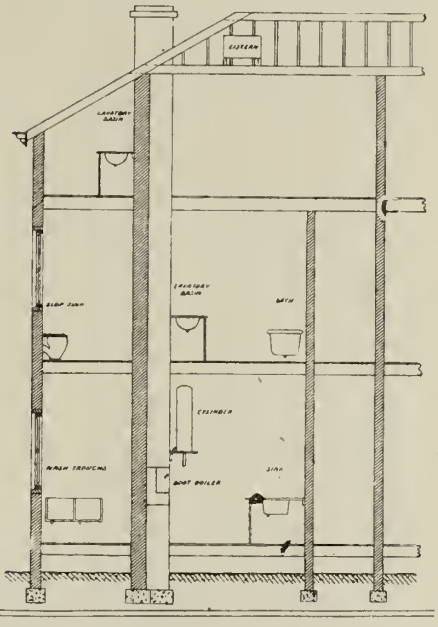
"The average citizen," he says, "takes altogether the wrong viewpoint in regard to apprentices. They object strongly to paying for them. This is wrong, as if no boys are allowed to learn the trade, it will be only a question of time before there are no plumbers. It is a big problem and one of the hardest to deal with at the present time."

PLUMBERS' BOARD OF NEW ZEALAND

PLAN B

Examination in Plumbing

Written Examination, July 4th, 1919
To be used with Question No. 5



MAKING CAMP SANITARY

Continued from page 19

Ho, you bully beef? This goes to the war camp by the million of tins and there is a fruitful source of waste, in a sense, in the discarded tins. Realizing that there would be a large aggregate weight of solder obtainable from the treatment of these tins, when empty, a simple "Recovering Plant" was evolved. This, as with so many successful little inventions, is the essence of simplicity from start to finish.

Corrugated iron, used by the ton on the army camping grounds, finds its place here, forming the roof, sides, ends and even the base on which the bully beef tins are thrown.

The little plant is three and a half feet wide and 4 feet long. The height is three and a half feet. In short, the plant is just a galvanized, corrugated box, open at the one end—the front.

Twelve inches above the ground a set of improvised grate bars have been arranged, these resting on three lengths of gas pipe, each 3 ft. 8 inches long. This provides a fire bed. Above this another set of gas pipes carries the sheet of corrugated iron on which the beef tins are thrown. This sheet is tilted so that solder will run. The fire now lighted, the solder melts from the cans and flows down the corrugations to a trough, which has been secured at the end of this sheet. Thus there is no loss. Coke is used as fuel.

Captain Bethune stated that one man had recovered 800 pounds of solder in this manner in one month from tins used by one division alone.

THE HEATING OF THE SMALL HOUSE

Continued from page 16

men, a system of piping as outlined is the safest to instal.

In most cases the mains leading to upper floor radiators are taken out of the end of the headers, but it will be noted that this plan shows such a main as being connected to one of the centre openings of the header. The connection is made that way in this case to compensate for the long lateral leading to the radiator in bedroom No. 2.

The pipe leading to the radiator in bedroom No. 1 should be taken out of the end of the header on account of its proximity to the boiler.

The Expansion Tank

The expansion tank is one of eleven-gallon capacity and is connected to the return pipe of the radiator in the bathroom. The system is fed with water from the city service by way of a valved connection set in expansion pipe, just below where the tank sets high up in the bathroom.

The Covering of Pipes and Boiler

The boiler is to be covered with 1¼ in. of plastic asbestos neatly troweled on, and the piping is to be covered with hair felt sewed up in canvas. The concealed risers will be covered with three-ply air cell covering.

Plans

Where pipe lines cross, one pipe line is shown as broken, so as to avoid the possible errors of assuming that a connection is indicated at such a point.

The drawings were made at a scale of ¼ inch to the foot, but, because of the necessity of reducing the drawings for reproduction we have shown a graphic scale that will always be in proportion to the drawings, no matter how much they may be reduced or enlarged.

Boiler

The boiler is to be a No. 3½ standard cast iron heater rated at 575 sq. ft.

What Causes Rate of Exchange

Simplified Explanation of Reason Why Canadian Money at Present Time is Worth Less Than That of United States—Natural Result of Our Immense Imports—Mistaken Ideas on Subject Prevalent.

By C. J. MORRIS

THE present disadvantage under which the Canadian merchant who has payments to make in U. S. is laboring, has brought to light an extraordinary lack of knowledge regarding the most elementary principles of international exchange, not only on the part of the general public, but also on the part of business men and even of newspapers which attempt to instruct their readers as to the causes governing the premium or discount at which one country's currency may stand in relation to that of another country.

It is by no means infrequently that we find in the daily press statements to the effect that the imposition of an exchange rate upon Canadian money by the United States is by no means a friendly proceeding, and advocating retaliation by the imposition of a similar rate of exchange upon all United States money spent in Canada. Such remarks only show how utterly the writers fail to realize the significance of an exchange rate.

To threaten to impose an exchange rate or discount upon United States money spent in Canada at the present time would be a proceeding equivalent to that of a householder, without a pound of coal in his cellar and with coal almost impossible to obtain, going to his coal dealer in mid-winter and informing him that unless he were willing to supply him with coal at a reduction of five per cent. on the ordinary rates he would refuse to purchase any from him.

U. S. Money Needed in Canada

It is the very fact of our being unable to get sufficient United States money in Canada to pay for all we buy from the States that makes it worth our while to pay a premium for it. It is really we ourselves who, by offering a premium for United States money because we have such urgent need of it, cause our own money to be at a discount in relation to that of the States.

A few days ago a Toronto paper informed a correspondent who enquired the reason for the rate of exchange, that such rate represented the exchange broker's estimate of the holder's chances of payment. Presumably the rate of exchange, in this writer's opinion, was an insurance premium paid to the broker, who in return guaranteed the solvency of Canada and due payment of her obligations. A moment's thought will show that this could not possibly be the meaning of the present exchange rate of 4 per cent. on Canadian money, as that would mean that the chances against Canada going bankrupt were only 25 to 1.

It is doubtful whether one business man in twenty understands what a rate of exchange really is and how it is caused. It is, therefore, the object of the present article to endeavor to make it clear by a simple illustration which can be understood by everyone.

The various nations of the world with their different paper currencies might be compared to the merchants of a community who agreed to trade together, accepting one another's vouchers in payment for their goods. Let us suppose that in such a community B is a baker and P a piano maker. B purchases a piano from P and also sells him bread. Till the piano is paid for B simply hands P back the latter's own vouchers in payment, and no difficulty arises. B does not require another piano, but P still requires bread, so B still accepts P's vouchers. P is still selling pianos to other members of the community, so B uses P's vouchers to pay them for goods he buys from them and the arrangement still works well. Let us suppose, however, that a time arrives when everyone in the community has bought a piano and P's vouchers become a glut in the market, as no one requires them. B, however, knowing that P is selling pianos to a dealer in a distant city, pays this dealer a visit and asks him to buy P's vouchers from him. The dealer says he would be able to use them at some future time and offers to take them if B will allow him a discount on them. B is obliged to agree to this, and disposes of the vouchers for cash, less the discount. He then informs P that if he accepts any more of his vouchers he will have to charge him a percentage on them.

The Two Cases Parallel

Here we see that P is buying from B more than he is selling to him, with the result that his money (vouchers) is at a discount. It is not in demand and its value consequently falls. In the same way Canada has made immense purchases from the United States and has not made sales to anything like a similar amount, the balance in favor of the States amounts to hundreds of millions of dollars, which we must pay in United States money. United States money is therefore much in demand, and we have to pay a premium to get it. Whether we pay a premium on United States money or sell our own money at a discount is the same thing.

Reverting to the above illustration, it is not B's fault that he has to charge P a discount on the currency with which P pays him. He gains nothing by so doing. On the contrary, he stands to lose, for it is evident that so long as P has to pay extra for his bread he will not buy from B more than he can possibly help. In fact, he may consider the advisability of getting the bread from the city to which he is sending his pianos and where his vouchers are probably not at a discount. B, therefore, far from benefiting from the exchange he is compelled to charge, stands a very good chance of losing a customer.

Merchant Not Benefited

In the same way the rate of exchange which the Canadian purchaser is compelled to pay to the United States merchant in no way benefits the latter, but has the effect of inducing the Canadian merchant to look elsewhere to fill his requirements. At the best he can only hope to get orders for as little as his Canadian customers can possibly get on with, and at the most he may lose his customers altogether.

The premium upon United States money has exactly the same effect upon commerce between the two countries as the imposition of a duty of the same amount upon all imports into Canada from the United States would have.

Where the Money Goes

The question will naturally arise: If the merchant gets no benefit from the exchange, who does get it? Where does it eventually go? This brings us to the part the broker plays in the matter. It is manifest that the Canadian merchant who has made a purchase of goods across the border has no time to go running around among his fellow merchants looking for somebody who has made a sale in order that the amount he has to send abroad may be offset by an equivalent amount which some merchant on the other side has to send into Canada. In fact, where the imports greatly exceed exports, it would frequently be impossible for him to find such a person. This is where the broker comes in. He undertakes to act as a clearing house for all parties and will either sell or buy United States drafts, and the broker in the United States will either buy or sell Canadian drafts. So long as the volume of transactions each way is fairly level no difficulty arises, and he makes only a small charge, a fraction of one per cent., to recompense himself for service he renders. But as soon as one country's purchases exceed its sales he is faced with the problem of what to do with the suplus of that country's money which begins to accumulate in his hands. He undertakes to absorb the surplus in one way or another. It is clear it would not pay him to hoard it and receive no interest upon it. If therefore, he cannot transfer it to some country which

Continued on page 33

What Others in the Trade Are Doing

How Sanitary and Heating Engineers From Coast to Coast Are Going After Business—Seasonable Appeals Just Now Will Mean More Business For You

Simmons Bros., Kingston, Ont., show an illustration of a workman installing a furnace. Their ad. is two columns wide and 3 inches deep. Under the heading in display type, "**Have Us Instal Your Furnace,**" they say, "Have us instal your furnace now so it will be all ready to use when needed. We are prepared to put in new flues, cold air boxes, or to build an entire furnace if required. We have ample facilities and equal skill. You can depend upon our work every time, and you'll find upon inquiry that our charges are always extremely reasonable."

* * *

Nutana Plumbing and Heating Co., Saskatoon, uses a single column space, 3½ inches deep, and says: "Nutana Plumbing and Heating Co., contractors and jobbers, plumbing, steam, water and warm air heating, sheet metal work, ornamental special designs, boilers, radiators, jacket heaters. Contractors' and builders' attention—We sell and instal Economy furnaces. This is positively the most compact, efficient and practical heating plant, barring none. Plans, specifications and full description furnished. Country work—write and tell us what you want done and we will give you an immediate reply."

* * *

W. J. Walsh, Hamilton, Ont., in a double column ad. 4½ inches deep, announces under the heading in heavy display type, "**Sale of Plumbing Fixtures,**" "Let us examine your heating system and have everything in first-class condition for the winter. We renew smoke pipes and all tin work. For the week we are having a sale of plumbing fixtures and sundries. Below are a few of our prices: 1—5 ft. porcelain enameled, 3 in. roll rim tub, $45.50. 1—18x21 porcelain enameled apron lavatory, $21.45. 1—Aristocrat, 2 division cement laundry trays, $45.00. 1—18x30 porcelain enameled, roll rim sink, all in one piece, at $22.00. 1—Low-down closet combination, $30.00. Plumbers' supplies, heating supplies. Call and see us."

* * *

C. J. Peppin, Belleville, Ont., plumber and electrician, in a single column ad. 4 inches deep, under the heading in display, "**Electric Lamps,**" says: "Just received a supply of genuine lamps, made in Canada and the best on the market at same price as inferior lamps. Prices given on electric wiring and plumbing. Prices right. Phone 462."

* * *

A. J. Wise Heating and Plumbing Co., Toronto, in a single column ad., says: "Beware. Don't wait for cold weather to have your heating system overhauled; consult our experts now. No job too distant; no service too great. Just call Hillcrest 1610."

* * *

James Brandon, Saskatoon, in a neatly arranged ad., one column wide and 3½ inches deep, shows a cut of a workman pointing to a hot water heater he has just installed and says, under the heading, "**Hot Water,**" in display, "Need not be a luxury in your home if you have us put in one of our hot water heaters. You can heat water in less time than it takes to tell about it and without building a big fire in the kitchen range. Besides saving you all kinds of inconvenience and bother our hot water heaters are real economy. Phone 4016."

* * *

Mainer & Bartindale, Orillia, Ont., use a double column space, 5 inches deep, and show an illustration at the top of a bath tub with the taps turned on and water pouring out. Under the caption, "Bath Plumbing," they say: "We supply quality goods and install them in the best manner, and our prices are right. Get our prices on wiring. We have a first-class electrician to look after your needs. Remember we sell fixtures, lamps, bulbs, etc. Furnaces—Look to us to clean and repair your furnace now. It ruins your furnace to leave it in a dirty state all summer, and rots and rusts it out. We also look after the repairing of your roofs, eavetroughs, etc. Call us at 'phone 124."

* * *

Adair, the Plumber, Kincardine, Ont., in a double column ad., six inches deep, says: "Adair, the plumber, Kincardine, is now settled in his new and up-to-date quarters in E. Miller's old stand, south of the Morgan House, and invites the public to call and inspect the well-assorted stock of plumbing supplies he has in stock. No one can afford to fumble with plumbers. That's logical. Quite true. That's why we are always on the lookout to protect our customers' interests in the way of acquiring good workmanship and materials. We aspire to give our customers the two greatest factors above mentioned, coupled with our always ready, six-days-a-week service. We aim to please. Are you going to rod your barn or house, Mr. Farmer? If so, let us demonstrate to you the superior qualities of —— lightning rods. Repairing of all kinds solicited. Estimates furnished on plumbing, heating, eavetroughing and everything in tinsmithing line."

* * *

E. Y. Lane, Truro, Nova Scotia, in a two-column ad. two inches deep shows an illustration of a workman repairing a down-pipe, and in the reading matter says: "Have you a leaky eavetrough or rain water conductor? We do all such work. We carry plumbing and heating goods of all description. Enameled and tin kitchen furnishings. Call E. Y. Lane, Phone 485-W, Plumbing, Heating and Furnaces."

* * *

Parrott & Byers, of Yorktown, Sask., in a double-column advertisement 3½ inches deep, feature in large display type, "Plumbing, Heating, Tinsmithing, Galvanized Iron Water Tanks, Pumps, Sinks. Estimates cheerfully furnished for contractors. No job too big—no job too small. Phone 126."

* * *

Adam Clark, Hamilton, Ont., in a single-column ad. 2½ inches deep says: "Now is the proper time to have inspection and contemplated alterations made to your heating and plumbing. Do not leave it until the fall when the rush is on. Heating, plumbing, ventilation, sprinkler systems."

* * *

Byrne Bros., Toronto, Ont., in a single-column ad. under the heading in display type "Plumbing Service," say: "It is a safety first asset to you. We can attend to your wants at a few moments' notice, and possibly save your building from expensive damage from leaking pipes, etc. Night or day is all the same to us. Our men are right there, no matter what time you are in need of our service car. Get your furnace put in order at once. You may need a temporary fire almost any time now, a dirty or out-of-repair furnace may be costly in coal consumption, and also dangerous. Phone Parkdale 3213."

* * *

P. Atkinson, Preston, Ont., in a single-column ad. features in display type: "Plumbing, Steam and Hot Water Heating. First-class workmanship guaranteed. Estimates given. Jobbing attended to. Phone 19."

EDITORIAL COMMENT

THE nearest that many people can get to a reason for the present cost of living is that everything is going up because everything else is.

* * *

THE man who does not advertise because he tried one ad. and did not get results should throw away his cigar because the match went out.

* * * *

TO-DAY in business, the greatest competition is in quality, not in price. It pays to sell the better goods, as people are realizing now as never before that the best is the cheapest in the long run.

* * *

THE only kind of advertising that does not pay is that which is not properly done. Good advertising is an investment that returns a profit. It is never an expense.

* * *

THE scarcity of housing accommodation all over the country is becoming increasingly acute. Many a young married couple set out these days to find just the kind of a house that will suit them and end up by being glad to rent any rooms they can get. As long as conditions of this kind prevail more and more building is inevitable.

* * *

UP TO the time of going to press, housewives had not called a strike for a thirteen-hour day or a minimum allowance of spending money, but most women are demanding more and more time and labor-saving devices to work with and the hardware men are selling ten where they sold one a few years ago.

CORRECTING A WRONG IMPRESSION

TO remove doubts which exist in some quarters as to the relation of the Income Tax Act to the new Victory Loan it is necessary to state that it is the interest on the bonds that will be subject to the taxation—not the principal.

An impression has been created to the effect that the amount of the investment on Victory Bonds is to be taxed. Of course such is not the case. The interest derived from the new bonds will bear taxation just as other items which go to make an income will be taxed. This, however, will not be a matter of much concern to the small investor as the income received by the average person is not touched to a great extent by the act. Total incomes not exceeding $2,000 in the case of a married person and $1,000 for a single person are exempt regardless of the source from which the money comes. There is further exemption for the married person with dependent children, the amount being two hundred dollars for each child under the age of eighteen years. For instance, the income of a person with four children is exempt to the extent of $2,800.

The idea that the amount of money invested in the Victory Loan is to be taxed is quite wrong. Only the interest on the bond comes under the tax.

THE REMEDY

CHARLES M. SCHWAB, the steel magnate, speaking in Chicago recently made the significant statement that all the theoretical questions in regard to the cost of living would be set at rest "when we get back to the practice of giving an honest day's work for an honest day's pay." Unquestionably one of the great causes for high prices is just that lack of honesty that is world-wide. The supreme need of the world at the present time is for production, and for the speeding up of the transport of food and other commodities from the point of production to the point of consumption, and as long as we have a Bolshevik Russia, and Europe generally torn by dissension, as long as we have strikes and lockouts and persistent demands for ever-shortened hours and ever-increased wages throughout the world, there can be no real remedy found for the cost of living. It is not claimed that all these industrial disturbances are unwarranted. They are in many instances, at least, entirely justified, but there are many cases in which even these just disputes might easily wait. The need of production is imperative beyond anything else and the world certainly needs to give up thinking too much of its wrongs and grievances and get down to thinking about giving its honest day's labor for an honest day's pay.

THE POWER OF ADVERTISING

FOR every person who knows what he wants and comes into your store and asks for it, there are scores of what might be called latent purchasers who know what they want only when it is placed clearly before them and suggested to them. This is one of the main reasons why sales forces exist, trained men and women who can show the advantage of a product to prospective buyers. Advertising is one of the greatest sales forces there is if intelligently used

and directed. Its power lies in its ability to reach and convince the maximum number of people in the shortest possible time. This is one of the reasons why the greatest merchants in the world are consistent users of advertising space. They not only use space, but they use large space and they fill it with matter that has a real interest to the thousands of men and women all over the country who read it. Many of the ads. suggest to the readers things they need and which they gladly buy when they remember that they require the goods or will require them.

CANADA'S STRONG POSITION

JUST a month from to-day the world will celebrate the first anniversary of the signing of the armistice. The nations have been at peace—or rather what has been called peace—for nearly a year. Looking back now one can hardly help contrasting the predictions of eleven months ago with what has actually transpired. Many retailers at that time confidently predicted falling commodity prices with the cessation of the war demands and acting on that assumption went light on buying, some of them very light. Not only retailers did this, but wholesalers in many cases as well. Yet prices have risen and risen until many of them stand at the highest levels in the memory of living merchants. Food and raw materials, instead of becoming cheaper and more plentiful, have become dearer and more expensive. War debts have grown greater instead of less. The currency of most of the belligerent nations, instead of contracting, has expanded faster than during the war period. Instead of returning to order from disorder, many nations have drifted further into disorder. It has been said in some cases that "War is hell, but Peace is worse." International financial relations inevitably reflect the tendencies of commercial intercourse and the inflation of national currencies. Exchange rates of foreign countries have shown remarkable variations. The rate of exchange against Canada in New York has been high, but not so high as against England. In the New York market recently, it would cost a Britisher $1.18 to buy $1.00 worth of goods. It would cost a Frenchman $1.78, an Italian $1.96, and a German $7.40. Naturally conditions of this kind have an enormous effect on trade. Added to this is the situation brought about by the strike of the steel workers in the United States and of the railway workers in England. The railway strike is settled and the steel strike is likely to wear itself out shortly, but their effects on business remain.

In striking contrast to these troubles of other nations is the strong position of Canada. Business has perhaps never been better in the history of the Dominion. The nation has real cause for thanksgiving this year in rich and abundant harvests, the return of peace and generally satisfactory conditions. There has been plenty of work at good wages and the people generally are prosperous. The great trouble of merchants generally, and of hardware men in particular, has been to get enough goods. Many of those who bought very conservatively, fearing a drop in prices, saw their mistake when it was too late to remedy it. "We could have sold just 25 per cent. more goods if we had only had them," said the buyer of a large wholesale hardware house to SANITARY ENGINEER. "We played it safe. While we have done an excellent business, we could have done a lot more." This condition is general. The business outlook is good. As far as Canada is concerned it looks as if this country is just entering upon the greatest era of prosperity it has ever known. While we have had labor troubles and other troubles, they have been insignificant compared with those which have been rending other nations. On the whole, business conditions in Canada are sound, in the hardware business especially, and the outlook is for them to be even better.

MAKING NEW RECORDS

"PERMITS Continue to Soar," "Building Figures Break All Records," "Hundreds of New Houses," headings like these are as common in the newspapers these days as dispatches about strikes, and there never was a time when strike stories were so numerous. It has unquestionably, though, been a wonderful building year, and there is every indication that the activity will increase right through the fall and break all past records in 1920. In spite of all the houses that have been built this year, it is practically impossible to obtain a house to rent in many places. In the larger cities conditions were never worse. Rents are higher than at any time in the history of the Dominion, and not only that, but there is an acute scarcity of houses to rent. A situation of this kind presents an opportunity to men with money to invest to make good returns and help their community grow by building dwellings. This is being done in many cases and among those building are several hardware merchants. All over the country plans are being prepared for new buildings. Some of this work will start this fall. Hundreds of thousands of dollars' worth will proceed in the spring. All this activity means business for the hardware merchant. It means business in two ways. The hardware merchants can supply not only the supplies for erecting the buildings, but also the hardware for the people who are going to live in them. Business has been exceptionally good this season and the greatest trouble most hardware merchants have had is to get enough goods to fill their orders.

News from Here and There

CONTRIBUTIONS OF NEWS GLADLY ACCEPTED

New Firms

Charest and Lamontagne, tinsmiths and plumbers, has been registered at Coaticook, Quebec, by Joseph O. Charest and Eugene O. Lamontagne.

Personal

E. H. Russell of London, Ont., was a recent visitor in Toronto, and while in the city called at the office of the Ontario Society of Domestic, Sanitary and Heating Engineers.

Trade Notes

Locke & West, plumbers, Toronto, have dissolved partnership.

Jodoin & Paquette, Montreal, manufacturers of patent sewer pipe, traps, have dissolved partnership.

The Plumbers' Exact Supplies, Limited, is negotiating with the council at Fredericton, New Brunswick, for a site on which it is planned to erect a new factory.

Obituary

The death occurred at Kingston, Ont., of Nicholas Timmerman, for many years Sanitary Inspector of the city. He was seventy years old and a native of Holland. For some time past Mr. Timmerman had been a member of the police force.

George Buchaupt, aged 66, for many years Sanitary Inspector at Kitchener, Ont., is dead. He had been ill for some time. His wife, a daughter and two sons survive.

Incorporations

Gravit Stoker Furnace Company, Limited, head office Winnipeg, capital $250,000, plans to carry on a general business in heating equipment and plumbers' supplies.

Lightning Devices, Limited, head office Winnipeg, capital $20,000, plans to manufacture and deal in heating ,lighting and burning devices operated by oil, coal oil and gasoline.

Lalley Farm Lighting Co., Limited, head office Winnipeg, capital $25,000, plans to manufacture and deal in lighting plants of all kinds.

Associated British Industries of Canada, Limited, head office Montreal, capital $100,000, plans to import and manufacture paints, varnishes, rope, twines and many other lines of hardware goods.

Canadian Consolidated Corporation, head office Toronto, capital $110,000, plans to manufacture and deal in electric lamps, iron, steel and brass goods.

Canada Brass Products, Limited, capital $50,000, head office Montreal, plans to manufacture and deal in electric light fixtures and brass goods.

The Salem Oil and Grease Company of Canada, Limited, head office Farnham, Quebec, capital $45,000, plans to manufacture and deal in oils, grease and lubricants generally.

MONCTON, N. B. FIRM IS BUSY

The St. Thomas Johnston Company, Limited, of Moncton, N. B., have received the contract for the hot water and plumbing of the new express building for the Canadian National Railways. The contract runs about $4,800. The firm also has a $15,500 contract for the hot water heating and plumbing for the new Liberty Block, L. Higgins, owner; contract for the electric lighting in the Academy Building, $10,000, and contract for electric lighting for the new Canadian Bank of Commerce at $2,500.

APPOINTED CITY ENGINEER

W. C. Miller, who recently returned from overseas, has been appointed City Engineer at St. Thomas, Ont. He is a graduate of Queen's University, and prior to graduation, was for several years with the Department of Railways and Canals as assistant engineer on the Severn Division of the Trent Canal and the Swift Rapids Power Development. Later he was Military Foreman of Works in the camp at Kingston. His duties at St. Thomas will include the looking after of waterworks and sanitation.

ENGINEER RESIGNS

James Boyd, chief engineer of the Waterworks Department of the city of Toronto, has resigned his position owing to ill-health after 44 years of continuous service. Mr. Boyd, who is now 78 years old, took over his duties in 1875.

PROFESSOR BATEMAN JOINS J. L. MOTT IRON WORKS STAFF

Professor Arthur Bateman, whose special articles have appeared many times in Sanitary Engineer during recent years, has resigned his position as head of the Sanitary Department of the American School of Correspondence, Chicago, and has become associated with the Chicago office of The J. L. Mott Iron Works. Mr. Bateman, it is understood, will call upon the architects of Chicago and do promotion work for the Mott Company in that territory.

PLUMBERS AT LONDON, ONT., GET HIGHER WAGES

Journeymen plumbers at London Ont., have completed an agreement with the Master Plumbers. The new rate will be from now on 60 cents an hour as a mini- and 70 cents an hour as a maximum, and and from January 1, 1920, to continue for one year, the wage scale will be 70 cents an hour as a maximum and 80 cents an hour as a maximum. The scale has been 55 cents flat. If either party wishes a change at the expiration of the agreement, he shall give three months' notice prior to December 31, 1920. The men will receive time and a half for overtime and work an eight-hour day. All bosses signed the new agreement.

WILL MEET IN JANUARY

A general conference of the members of the Canadian Association of Building and Construction Industries will be held at Ottawa, commencing January 27. In connection with this a joint meeting may be arranged at which members of the Domestic Heating and Sanitary Engineers will be present. The matter of attending the meeting of the Association of Canadian Building and Construction Industries to be held in Winnipeg at the end of November is being considered at the present time by the sanitary engineers of Manitoba and Saskatchewan, and it is likely that matters of national interest in which all the sanitary engineers of Canada are concerned may be brought up at Ottawa.

Tenders

Delmer Kearney, Alvinston, Ont., will call for tenders shortly for garage building to cost $10,000. Heating and plumbing.

F. W. Warren, Bank of Hamilton Building, Hamilton, will call for tenders about November 15, for work in connection with stores and apartments to cost $200,000.

Charles King, 312 Brock St., Brantford, Ont., plans to erect dwelling shortly and is interested in prices on plumbing and heating.

I. G. Komft, Calgary, Alberta, wants prices on heating and plumbing for $5,000 bungalow now under construction.

E. Butterworth, 183 Burris St., Hamilton, has commenced work on two resi-

dences to cost $4,000, and is interested in heating and plumbing prices.

H. H. Weeks wants prices on plumbing and electrical work for new $4,000 residence on which work is starting.

Barrett Bros., 260 St. Catherine St., Ottawa, want plumbing prices on dwelling costing $5,000.

M. E. Davis, 33 Bellwood Ave., Ottawa, wants prices on heating and plumbing for $5,000 residence on which work is started.

Griffin Contracting Co., 3 McRoberts Ave., Toronto, want prices on plumbing and heating for residence and garage costing $5,800.

Geo. Cross, 416 Kingston Road, Toronto, will let plumbing and heating work for two residences costing $7,000.

A. E. Painter, 131 Pinewood Ave., will let heating and plumbing work for residence costing $4,500.

H. C. Fisher, 37 West Lynn Ave., will let heating and plumbing for bungalow costing $4,000.

A. Stratford, 113 Constance St., Toronto, will let plumbing, heating and electrical work in connection with two residences to cost $8,000.

A. W. Kettlewell, 133 Gladstone Ave., Windsor, Ont., will let heating and plumbing for four flats to cost $9,000.

A. H. Harding, Brantford, Ont., will let heating, plumbing and electrical work in connection with residence costing $10,000.

T. L. Church, Chairman of the Board of Control, Toronto, will receive tenders until October 21, for plumbing work, electric wiring and fixtures for new public lavatories to be erected at Centre Island.

Credit Men Fight Discount Violators

The National Association of Credit Men has appealed to its 29,000 members in the United States for the enforcement on buyers of a strict observance of cash discount terms.

In a bulletin the association directs attention to the fact that no negligible part of the high prices to-day is directly traceable to the unnecessary burden of distribution expense, which the failure of a general observance of the discount terms has forced.

Failure to enforce the discount terms, it is argued, has fostered an aggressively independent attitude on the part of many buyers, who then carry their demands on the manufacturer to the point of special allowances which are not only unfair to him, but unfair to those merchants who do live up to the discount terms. In the last analysis the loss to the manufacturer must be made up through his aggregate receipts, and in his fixing of prices the innocent as well as guilty have to bear this burden.

"We say fearlessly to the seller and the buyer," the association announces, "that they are helping to maintain high prices, are imposing unnecessary burdens on business, are encouraging laxity and a lower level of character in business whenever a cash premium is demanded and allowed after the expiration of the time in which it properly should have been taken.

"No one, no matter how big or how prominent he may be, can escape the charge of an unwise and immoral transaction, whenever in the buying and selling of commodities he demands or permits the taking of a premium in the payment of an account when the premium has not been earned."

Joint Meeting May Be Held At Winnipeg in November

Domestic Sanitary and Heating Engineers of Manitoba and Saskatchewan Considering Co-operating With Association of Building and Construction Trades.

ARRANGEMENTS have been completed for a meeting at Winnipeg, in November, of the Canadian Association of Building and Construction Industries, to discuss various matters of importance to the trades, and a move is under way at the present time to have the Domestic Sanitary and Heating Engineers of Manitoba and Saskatchewan meet at the same time.

There are many matters in which both organizations are especially interested, and the Domestic Sanitary and Heating Engineers feel that by closer co-operation between the two bodies, some real results may be obtained. One of the matters which will be taken up if the joint meeting is arranged, will be revision of some of the existing laws in regard to both building and plumbing.

It is generally felt that in many municipalities there is room for a good deal of improvement in some of the existing statutes and also in the way in which some of the existing laws are enforced. By taking up these matters and adjusting matters it is believed that a progressive step will be taken that will improve sanitation matters and in doing this benefit health generally.

Both the Domestic Sanitary and Heating Engineers and the members of the Canadian Association of Building and Construction Industries are interested in the work of fire prevention that is being carried on all over the Dominion, and it is likely also that a discussion will take place regarding ways and means of bettering building construction and eliminating the enormous losses that have been occurring.

Toronto "Ender" Clubs Hear Discussion on Importance of Overhead

FOLLOWING a vacation period during the hot months, the "Ender" Clubs of Toronto, resumed their regular meetings this week. The same schedule as before is being followed, that of meetings for the various clubs on Monday, Tuesday and Thursday evenings.

At the meetings held this week, the feature of the program was a talk by Secretary Garrett Frankland of the Ontario Society on "Overhead".

Secretary Frankland declared that overhead is the first thing a man in business should worry about. Any number of men in all lines of business, he said, are not worrying about it because they do not appreciate what it is and what it means to their success or failure. It was impossible, he pointed out; for business to be run properly unless strict account of all outlays was kept. Simple as this seemed, many men who thought they were including all outlays were omitting some of them, wondering how it was, at the end of the year, they were not making money or not making the profits they should.

He discussed also the question of the Master Plumber paying himself a proper salary. Many men, he said, based their salaries on the wages paid to journeymen.

"If your business will not pay you more than this," he said, "why continue it? Why take all the worry and care and bother of looking after a business if you are only making journeymen's wages? Why not go back and take the journeyman's wages and get away from the bother? In days gone by all that was necessary for a man to start in business as a plumber was a kit of tools. That day is past. Now before a man can start in business, he must hire a bookkeeper or instal a set of books so that he can keep proper records to take care of his business. He must know all about his overhead in order to figure out the profits he needs to stay in business. Overhead is the principal item for him to consider. His whole success in business revolves around it and the more accurate his records are the surer is the foundation upon which he is building."

CORRECTION

In last issue it was stated that H. B. Wilcox, Toronto, had discontinued his plumbing and hardware business. Mr. Wilcox advises us that the hardware end of the business only, has been discontinued, and that the plumbing business will be carried on at 201 Jones Ave., Toronto, under the name of the Elite Plumbing Company.

Great Activity in Quebec Foreshadowed By the Housing Schemes

Co-Partnership Plan is Being Followed in Some Sections—The $7,000,000 Available from Government Has Been Oversubscribed.

A BIG market for sanitary equipment of all kinds and greatly increased activity in the plumbing trade generally is foreshadowed by developments in Quebec. Under the housing schemes of the Province of Quebec, $7,000,000 of the total amount of $25,000,000 appropriated by the Federal Government is to be expended. While the actual details of the scheme are still in the making, housing schemes are being inaugurated for a number of municipalities, including Hull, Sherbrooke, Ste. Anne de Bellevue, Quebec, Three Rivers, St. Jerome, and St. Lambert. These municipalities are at present negotiating with Dr. E. Nadeau, Provincial Director of Housing for Quebec. As evidence of the interest taken in the project, it is interesting to learn that the total amount involved in the applications received to date from the various municipalities is $17,000,000.

Follow English Plan

It is proposed to develop these housing schemes along the lines of the co-partnership principle, which has been applied so successfully in England. Garden cities will be laid out in blocks of from two hundred to five hundred houses, with ample space for playgrounds, and public improvements taken from the best town-planning experience available, and adapted to the Canadian schemes, will be provided. For example, central heating plants will be provided where possible. The expenditure of $7,000,000 will be spread over two or three years, the annual outlays being about equal. It is planned to complete the details of the various schemes this winter and to call for tenders next spring. Mr. F. G. Todd, of Montreal, is the town planning expert of the Quebec Technical Commission.

Adopted by Quebec

At Quebec City, a Citizens' Committee has been formed to co-operate with the municipal authorities in the matter of working out the details for the local housing scheme. The idea is to organize a housing company with a limited annual dividend of 6 per cent., interest to be paid semi-annually, and the capital to be redeemed in thirty years. The company will give the City of Quebec a first mortgage upon its land, and all houses to be erected thereon, and the city will appoint one of the members of the Company's Board of Directors. The aim of the company will be to develop a model garden suburb of some five hundred houses. The probable period of development will be five years, and the total estimated cost is $1,500,000.

Advances will be made on approved estimates from time to time by the City of Quebec providing the paid-up capital of the company is not less than 15 per cent. of the cost of the undertaking. The plans and specifications of the buildings and improvements, as well as the supervision of the actual work, will be furnished by the Provincial Technical Commission at a cost of 2½ per cent. The company will be organized under the system of the English housing societies, known as the Co-partnership Tenants, Limited, in which each tenant subscribes at least one share of the company's capital, from which he receives interest limited to 6 per cent., the tenant being encouraged to subscribe such shares until the amount of his subscriptions has reached the cost of the house he is occupying, at which time he may become the owner of the house. The annual rent of the houses is to be fixed at 10 per cent. of the total cost of each house and lot. Rents will vary from $15 to $50 a month.

DEATH OF FRANK D. LYMAN

Frank D. Lyman, vice-president and managing director of Lyman Tube and Supply Co., Ltd., Montreal, died in Montreal on Thursday, October 2. He had been at the club house of the Anglo-American Fish and Game Association, near Metis, Quebec, with a friend from the States, and suffered severe attack of indigestion. This was complicated through an attack of bronchitis.

For some ten years prior to the organizing of the Lyman Tube and Supply Co., Ltd., Mr. Lyman was manager of the Railway Supply Department of John Millen and Son, Ltd. When this business was taken over in 1916, the new firm formed as above was made an incorporated company, and the business has since been managed by the late Frank D. Lyman.

Among the activities with which he was associated were the Anglo-American Fish and Game Association, and of which he was secretary-treasurer; member of the Engineers' Club, Kanawaki Club, Montreal A.A.A., Rotary Club and the Automobile Club of Canada.

Mrs. Lyman (formerly Miss Ethel Wilson of Bridgeport, Conn.), and one little daughter, Kate Wilson Lyman, survive.

NEW HEALTH OFFICERS

Dr. N. O. Thomas, R.H., M.D., a returned soldier, of St. Thomas, Ont., has been appointed director of the Provincial Board of Health's new public laboratory at Fort William.

Col. Dr. Frederick Guest, M.D., of St. Thomas, who was overseas during the whole period of the war, has been appointed district officer of health in District No. 1, a position rendered vacant by the death overseas of Maj. D. B. Bentley of Sarnia. Dr. Guest's headquarters will be in London, and he will have charge of six counties, viz., Essex, Kent, Lambton, Norfolk, Middlesex and Elgin.

CATALOGUES and BOOKLETS

JOHN H. HALL & SONS, LIMITED, NEW CATALOGUE

John H. Hall & Sons, Limited, manufacturers of pipe cutting machines, rapid nipple machines, roller pipe cutters, and special machinery, etc., Brantford, Canada, have issued an attractively illustrated loose leaf catalogue, featuring the many lines made by this company. The catalogue is profusely illustrated and carries a great deal of practical information for jobbers, manufacturers, and the general users of power machines. The catalogue is printed on high quality of paper in two colors with an unusually attractive cover design, and on account of the loose leaf feature new additions may be made to the catalogue from time to time.

LETTER BOX

Query—Would you kindly advise us regarding the manufacturer of Kewanee valves?

These are made by the Kewanee Boiler Co., Kiwanee, Illinois, and the firm's Canadian representative is the Dominion Radiator Co., Toronto.—Editor.

Smead Dowd Repairs

Sam. J. Rendle, Paris, Ont.—Will you please advise me as to headquarters of the Smead Dowd Heating and Ventilating Co., formerly of Toronto, as I have two large furnaces to repair?

The American Foundry Company of Bloomington, Illinois, can supply repair parts, etc., for this line.—Editor.

"Well, my young lad," said the facetious man to the elevator boy, "I see in your position you have a chance to rise."

"Oh, yes," growled the boy, "but I get called down every time I do it."

Organizing the Niagara Peninsula

Directors of the Ontario Society of Domestic Sanitary and Heating Engineers Held a Most Successful Meeting at Welland—Practical Addresses Given on Organization, Co-operation and Overhead.

FOLLOWING the regular monthly meeting of the Directors of the Ontario Domestic Sanitary and Heating Engineers at Welland, Ontario, a meeting was held in the Builders' Exchange, at which a Welland branch of the organization was formed.

The joint meeting was attended by men in the trade from Welland, St. Catharines, Niagara Falls, Bridgeburg, Port Colborne, Thorold, Grimsby and Fort Erie, and plans were laid by which organization work is to be carried out throughout the entire Niagara Peninsula.

Series of Meetings

This will be done at a series of meetings, which are to be held in the near future. It is likely that they will be semi-monthly.

At the meeting held in Welland, J. H. Crowe presided, and during the time the directors were in town they were guests of the Welland plumbers and were entertained by them at dinner.

Keen interest was taken at the meeting in the Builders' Exchange by the men from the entire district in addresses given by President Frank R. Maxwell of the Dominion Society, President Thomas J. Minnes of Brantford, head of the Ontario Society, and Garrett Frankland of Toronto, secretary.

Practical Addresses

President Thomas J. Minnes spoke at some length on conditions as they prevail at the present time in Ontario, and the great good that may be accomplished by organization. "The men in the trade in Brantford," he said, "found out what it means to work together. Not so very long ago, while they had a common trade, they had failed to realize that they had interests in common, and that what affected the welfare of one affected the welfare of all. As long as they kept apart they did not get anywhere and found that they were constantly suspicious of one another and attributing wrong motives to one another.

The Wrong Way to Work

"This sort of thing is more or less general throughout the whole Province, as a matter of fact, throughout the whole trade in Canada," said President Minnes. "As long as it continues, no great good can be looked for if allowed to drift along. These things invariably go from bad to worse, and in the meantime troubles that might easily be rectified by a little co-operation on the part of the men in the trade are permitted to develop and become serious annoyances. What many of the men in business to-day do not realize apparently is that they cannot help themselves without helping the other fellow, and that they cannot be injured in their own business without indirectly injuring everyone in the business. No one man working by himself can expect to get the results that may be obtained by a great body of men pulling together with one common aim. There are splendid results to be obtained by organization and co-operation, and we cannot get together too quickly. If every man in the trade will realize this and work with this end in view it will only be a matter of short time when noticeable improvements will be seen."

Satisfactory Results

Frank R. Maxwell of Toronto, president of the Dominion Society, spoke on the need of co-operation. He gave a splendid account of the results which had followed the getting together of the men in the trade in Toronto, and pointed out that exactly the same benefits may be obtained by the men in the trade anywhere, if they will only work together.

"Good fellowship," said President Maxwell, "just seems to develop naturally once men get started working together. When they talk their problems over one with another, they get away from all animosity and suspicion and soon find out that the chap they were a little inclined to look askance at is not such a bad fellow after all, and that he has problems exactly similar to their own. By getting together and working together on these problems, they can solve them and solve them in a way that is most satisfactory to all."

Says Get Together

President Maxwell urged the men in the Niagara Peninsula to get together and work together and promised them that they would be surprised in a very short time at the change they would find in everything. As long as men kept to themselves and tried to work their own problems in their own little way they were not only losing time and money for themselves but indirectly making it worse for the others in the trade. On the other hand if every man in every town worked together and every man in every province worked together, a revolution would take place in conditions that the men in the trade in Canada would benefit and make their influence felt throughout the whole country.

Tells of "Overhead

Secretary Garrett R. Frankland of Toronto, gave an educational talk on "Overhead," pointing out the vital importance it is to every man whose business is to know exactly where he stands, what his costs are to a cent, whether he is making or losing money, and how he can stop all troubles that are costing time and money. Too many of the men in the trade, he pointed out, do not appreciate the importance of overhead and do not as a result know what it is costing them to do business, or how much profit they are making or whether they are making any. No man, he stated, can expect to meet conditions as they exist in the business world to-day and remain in business and get satisfactory results unless he knows all about overhead.

Those Who Attended

Those who attended the meeting besides the directors were J. H. Crowe, who was chairman; E. Cardwell, W. R. Chambers, James H. Cunningham, representing C. R. Hagan, W. T. Boyd, all of Welland; James F. Bird and James A. Wray of Grimsby, William E. Wilkinson of Bridgeburg, F. C. Kulow of Bridgeburg, and Messrs. Payne and Nesbitt of Niagara Falls.

During the meeting of the directors, applications for membership in the Ontario Society of Domestic Sanitary and Heating Engineers were received and approved from Shearer and Russell, S. Y. Meredith, Harry Derrick, George Cooperthwaite, A. A. Earl and Son, and W. E. Ramsay of W. G. Edge, Limited, Toronto branch.

The directors of the Ontario Society of Domestic Sanitary and Heating Engineers are busy with plans for an official visit to Chatham and Windsor. It is likely that this visit will be arranged for the end of the month.

The men in the trade in Windsor organized this year and it is stated that some excellent work is being done at the border. It is expected that organization of the men at Chatham will be effected before very long as considerable interest is being shown in what the Society is doing, and it is felt that good results can be obtained by all working together.

BUILDING AN INTAKE WELL

The town of Fort Erie, Ont., following work started in the neighboring town of Bridgeburg, has let the contract for an intake well in the Niagara River. The contract price is $1,900. With this auxiliary it is expected that the pumping pressure will be maintained at standard.

Contractor Johnson is now engaged in the construction of a $4,000 intake well in the Niagara River, to be used in connection with the Bridgeburg pumping station. The weeds, fish, etc., that are sucked into the electrical machinery under present conditions will then be eliminated.

Heating and Ventilating

Ventilating the Modern School

Thirteenth Article of Series Written Especially for "Sanitary Engineer" by N. A. Kearns—First Article of Series Appeared in April 1 Issue

FRICTION seems to be a bogey that continually haunts the young and inexperienced ventilating engineer. A question often asked by these men is: "How should we allow for the loss due to friction in the air ducts?"

Not the Only Cause

Friction is not the only cause of loss of velocity head in piping systems. There is another loss known as dynamic loss, and which is due to changes in the direction, or in the velocity of the air. There is a dynamic loss at the entrance of the air into the piping system, and this loss may run from 1 to 1½ times the velocity head.

The dynamic loss in elbows depends on the radius of the elbow. The size of the elbows and the velocity of the air has no bearing on the dynamic loss. The proportion of velocity head lost at an elbow may be considered thus:

Radius of 1 diameter on the centre line, 25 per cent.

Radius of 1½ diameter on the centre line, 17 per cent.

What is Required

As a rule a radius of 1½ diameter proves to be all that is required. Anything greater than this does not seem to affect the friction nor dynamic losses enough to justify the expense of longer sweep elbows.

The loss in velocity head is greater where elbows occur in round pipes than where they are set in square pipes. The ratio is about 17½:25.5.

One in Fifty

We may consider that 1 velocity head is lost in 50 diameters of straight pipe, and that in a round pipe an elbow with a radius of 1½ diameters would be equal in effect to 8½ diameters of pipe. A square elbow in a square pipe would be equal to 4½ widths of the pipe.

Roughly, one easy long radius elbow is equal in friction loss to 10 diameters of the pipe.

Pressure Required

The pressure required to overcome the friction of air passing through each 100 linear feet of pipe may be taken as follows:

Diam. of Pipe	Velocity	Loss
10	600	.069
14	600	.050
16	800	.076
18	800	.069
20	1,000	.097
22	1,000	.088
24	1,000	.080
26	1,500	.166
30	1,500	.144
34	1,500	.127
38	2,000	.200
42	2,000	.181
50	2,500	.240

The loss in pressure is given in inches of water.

With the data given regarding the equivalent friction loss of elbow, it should not be difficult for anyone to figure how far a pipe might be run with a certain number of elbows before an absolute loss would result.

Proportioning Branches

When branches run a very short distance off the main duct it is often found that these short branches carry far more air from the main ducts than do longer pipes of the same area set even closer to the fan, so it becomes necessary when branch ducts are short to make proper reductions in area to offset the advantage of the short lengths. Dampers should be always placed in branches so that any duct too much favored may be partly shut off.

A Bad Effect

There is an evil effect obtained in the choking down of ducts too large, and the evil lies in drawing down the whole plant to meet the deficiency part. Therefore it is the pride of a ventilating engineer when he can say that not a damper need be adjusted to check a single duct of the system he designed.

In most school installations the engineer need not worry much over loss due to friction if he runs the elbows out at a radius of 1½ diameters on their centres, and if he sets his fan to deliver an initial duct velocity of from 1,600 to 2,000 lin. ft. per minute.

Allowing for Friction

A basis for allowing for friction is given here, and it must be borne in mind that the losses in ducts are due to much more than friction alone. The losses depend upon the material and the length of the duct; upon the number of elbows and their radius, and also on the change of velocity of the air where it leaves the fan to enter the duct. A system where every factor is taken into account when the design is made will result in a uniform resistance all over the entire plant without regard to distance from the fan.

Finding Friction

The friction in each duct may be found by adding together the number of times that the velocity head is lost at the entrance to the duct system and elsewhere. This may be considered as being represented by the figures 2½, also the loss due to length and size of pipe, this may be considered as being $\frac{L}{4.W}$. L is length in feet and W is width in inches; then add the proportion of pressure lost in elbows.

As an example we will take a pipe 100 feet long, 18 inches wide, and with four easy elbows.

Thus:

$$2\tfrac{1}{2} + \frac{100}{72} + \frac{4}{5} = 4.55 \text{ velocity heads.}$$

SEES BIG MARKET FOR CANADIAN ZINC

Cables from London, England, state that important developments are foreshadowed in the Consolidated Mining & Smelting Company at Trail, B.C., in the statement made by its president, J. J. Warren, who is negotiating the sale of the company's zinc output here. Mr. Warren says the market possibilities for the company's product in Europe, South Africa and India are unlimited as regards the disposal of zinc and allied metals. He adds that his doubts regarding the possibility of expanding the industry have been entirely transformed to optimism since his arrival in England two weeks ago. Canada can supply 10 per cent. of the world's demand, equal to 780,000 tons of zinc, and is only producing 25,000 tons. The impression he has gained is that the condition of the market warrants expansion to supply these 780,000 tons. Mr. Warren foresees no difficulty in arranging for increasing smelting facilities.

The Transportation Outlook

Warning Issued to Business Men by the Canadian Railway War Board Owing to the Acute Shortage of Cars—Three Tons Have Fallen from the Average Load of Canadian Cars.

THE Canadian Railway War Board has just issued the following bulletin to merchants and manufacturers all over Canada, outlining the position that has resulted from car shortage and showing how the situation can be relieved:

Three tons have fallen from the average load of the Canadian freight car. Instead of carrying 27.4 tons, as in 1918, the average car is now carrying only 24.4 tons. This does not mean a decrease in the total volume of freight moving, but an increase in the number of cars required to handle a given tonnage; an increase in the amount of tare-weight (weight of cars less freight) to be handled in each train; an increase in the number of engines required, the crews on duty, the coal consumption and the track-room occupied. The reserve margin of cars and engines is thus diminished and an unfavorable situation created alike for the railways and the shippers. To the latter, it may therefore be of interest to consider the following review of the transportation situation and the prospect for the approaching winter.

Had a Big Task

The cessation of hostilities in Europe with its profound effect upon industry on the North American continent, as elsewhere, has had corresponding influence upon the traffic movements and railway problems. The task of moving munitions of war eastward was quickly replaced by the task of moving returning soldiers westward. Following a lull in all domestic freight movement, new currents of traffic set in tending to approximate, in some degree, the old movements prior to the war. On the whole, however, up to the first of July last, the transportation situation became easy. Cars were plentiful. The necessity for loading them to full capacity became less apparent, and, in spite of warnings from this Board, the average load dwindled seriously, as noted at the beginning of this article.

Not So Satisfactory

Conditions now, however, are not so satisfactory. In March and April, the usual movement of box-cars to the wheat-growing areas commenced in both the United States and Canada.

In the United States, where strikes in car repair departments were added to the natural disadvantages of the "car pooling" arrangement, and where cars are, on the average, older than in Canada, the superior condition of Canadian box-cars for carrying grain, led many of these cars into the American West where the wheat movement begins in July, two months before the Canadian movement is under way. The balance of cars owing by the United States to Canada was thus increased materially, so that to-day there are approximately 43,000 Canadian box-cars in the United States as against 19,000 American box-cars in Canada; a net balance of 24,000 cars due Canada and unlikely for some time to be available to this country. This figure, it should be observed, is equal to over 16 per cent. of the total Canadian box-car supply.

Serious Additions

While this loss of cars to the United States has been checked and will ultimately be rectified by the return of the Canadian cars, serious additions to the volume of traffic to be handled by the Canadian roads are imminent. The shipment of coal from the Western Canadian mines since the beginning of the fuel year, on April 1st is, to date, only one-third of the amount forwarded in the same period last year. Movement by rail is correspondingly delayed and cars will be detained in the West accordingly. More serious still is the prospect that American ports will be closed this winter to Canadian exports. Sixty per cent. of Canada's export grain usually passes out by American ports. This will remain to be handled across Canada to Montreal, St. John and Halifax in Canadian box-car—adding one hundred and fifty per cent. to the volume of export grain now taken care of through the ports of the Dominion, and adding much more than 150 per cent in terms of car-mileage.

Not One Third

The seven thousand new freight cars built since last year are not one-third of the number now detained in the United States. The additional requirements for coal carrying and for the wheat trade—if the proposed American action is taken—will be extremely serious. At this time of year, too, comes a heavy movement of perishable farm produce, moving before the cold weather will necessitate using special cars. Yet, in the face of these factors—the average load per car in Canada has fallen three tons!

What It Means

The very serious attention of all Canadian shippers is called to this fact. It means that where eight cars were formerly required, nine are now necessary! Where 160 tons of tare-weight were thrown upon an engine for every 216 tons of freight, there are now 180 tons! Labor scarcity, once the excuse for the light loading, is no longer a fact. It is important in the interests of the country, that the heavier loading practices be restored. Railway efficiency is part of your factory, mine, mill or warehouse efficiency!

WHAT CAUSES RATE OF EXCHANGE

Continued from page 24

needs it, he will be compelled to purchase stocks or bonds of the debtor country and either hold them himself or offer them for sale at a price sufficiently attractive to induce purchases. It is to cover the cost of doing this that he charges a rate of exchange which varies as the excess of imports over exports increases or decreases.

Gold Payments Avoid Rate

One way in which a nation can avoid paying exchange is to pay in gold. Gold is the international medium of payment and has a fixed value in all countries and by sending gold in sufficient quantity to cover its paper money any adverse rate of exchange is at once wiped out. In the same way in the hypothetical case of B and P above. If P can pay B in ordinary money the question of exchange does not arise, but where P and B are issuing their own vouchers instead of money the value of these vouchers depends upon the demand there is for them and that is regulated by the amount of business each is doing. B being a baker, practically everyone could use his vouchers to pay him for the bread they required. If, however, B began spending very heavily and issued vouchers much in excess of the value of the bread he sold, his vouchers, too, would soon become a glut in the market and would be at a discount.

The writer has in the last month or two spoken with several retailers who could not understand why the exchange rate should necessitate their paying more for an article than they previously paid when that same article is selling at the original price in the States. The above explanation will have made this clear. The wholesaler from whom they purchase has paid nominally the same price for the article, but whereas formerly he could purchase the article with the Canadian dollar, he now has to pay with U. S. currency. To obtain this he has to pay practically $1.05 in Canadian money, and he is obliged to pass this extra cost on to the retailer.

In a short article of this nature it is impossible to go into every circumstance affecting the fluctuation of the exchange rate, but enough has probably been said to enable the average business man to understand clearly why it is he is at present working at a disadvantage when dealing with United States merchandise.

Sharp Order From Ontario Railway Board Results in Action at Peterboro

Plans for Sewage Disposal Plant Must Be Ready by First of December—City is Taking Steps to Improve Plumbing Conditions.

IMPORTANT matters in connection with plumbing and sanitation were taken up by the council at Peterboro, Ont., at its regular meeting. The Property Committee reported that steps had been taken to improve the plumbing conditions. An outside plumber will be brought to investigate conditions, and if his report shows they are not satisfactory steps will be immediately taken to make them so.

The Property Committee was given instructions to carefully look over the plumbing regulation bylaw and if any changes are necessary bring them before the Council with recommendations to amend the bylaws.

City Engineer Parsons reported that plans and specifications for the city sewage disposal plant must be drawn up, ready for inspection by December 1, This is the ruling of the Ontario Railway and Municipal Board.

"The site must be selected immediately," said the Engineer, "as it is dangerous to have any more delay in the matter." This was expressly agreed to by the Mayor and Mr. Widdifield.

Mr. Parsons said it would be advisable to instal the plant on the east side of the river. No matter if the plant is guaranteed not to produce odor it is nevertheless a sewage disposal plant and should not be placed in a residential district.

Steps will be taken to select a site at once, and as soon as one is selected, the Engineer will commence his plans for the plant. This means that everything will be ready by December 1, as required by the ruling of the Board.

Both the City Engineer and City Solicitor Widdifield interpreted the Board's order as a sharp command to the city to undertake this project without delay.

Seven Lives Lost When Gas Pipe Snaps at Ottawa

Need for More Stringent Laws in Reference to Building—Inspectors Have No Authority to Look Over Gas Pipes and Appliances.

A TRAGEDY that is perhaps without a parallel in the history of the Dominion occurred at Ottawa, when Pierre Cardinal, his wife and five small children lost their lives by asphyxiation from illuminating gas, when the supply pipe was broken perhaps by a heavy beam snapping it. The pipe was found broken at the joint under the front main floor of the house. Just what caused the break in the matter of conjecture. It may have been due to the building having sunk in the soft, sandy soil or it may have been due to a beam coming down on the pipe. The gas came direct from the pipe connecting the main with the kitchen stove.

The gas entered the house through several holes in the flooring and the largest volume gushed through an opening in the hallway. All but one of the victims was dead when found.

Laws Are Too Lax

One thing emphasized by the tragedy is that there is laxity in Canadian building laws. It has been pointed out from time to time in SANITARY ENGINEER that in many sections of the country the laws are not what they should be and that while other sections often have proper bylaws they are not enforced. The matter of protecting public life by proper building and plumbing laws is a vital one and cannot be too strongly emphasized. In the Ottawa case it would appear that there was no bylaw to cover the case in point.

"City building inspectors have not the necessary authority to visit private premises to inspect gas pipes and appliances," said Robert Henham, Ottawa's building inspector, in discussing the case. "They have authority to inspect and order repairs to buildings which they know to be in a dangerous or unsanitary condition."

With 479 buildings in the city of Ottawa either undergoing repairs or in course of construction, Mr. Henham said that his time is largely occupied, but admitted that there are several buildings sinking as did the house of the late Pierre Cardinal.

Mr. Henham attributed the sinking of the Cardinal home to poor building and lack of foundations. Many houses in Ottawa, he declared, had been rushed up without proper foundations, and as a result, are now gradually sinking into the soft, sandy soil.

The building bylaw, which is being revised, provides that proper foundations must be placed under all buildings and that greater care must be exercised in the work of construction.

This bylaw is aimed at jerry building and ensures safer homes for the citizens of Ottawa.

RUSTICENE

"Rusticene," manufactured by the Gramoline Co., Ltd., Lumber Exchange Building, Chicago, is, it is stated, a distillate oil with exceptionally penetrating qualities. The manufacturers claim that it is particularly effective in releasing metal joints that are bound tightly so

Small Tin of Rusticene

that they resist all ordinary means of relaxation. It will, it is stated, loosen rubber tires from rims, release bolts, nuts, pins, thumb screws, spring clips, knuckles, shaft bearings, turnbuckles, brakes, radiator roads, battery connections, cylinder pistons, and all joint or action parts. It removes road oil and tar from windshields or car bodies, and is invaluable wherever metal joints or

Large Can of Rusticene

bolts are exposed to weather conditions or corroding effects. It is stated that it is indispensable to rebuilders or wreckers of motor cars, ships, aeroplanes, tanks or power machinery. Rusticene is non-inflammable and inoffensive, free from acids and alkali, and will not injure metal, wood, rubber, leather or fabrics. It is also stated that it will dissolve rust, verdigris, carbon, red or white lead, ammonia scale, paint, tar, grease or dirt.

PLAN SEWAGE SYSTEM

The problem of providing a sewerage system for North Danforth and Todmorden, suburbs of Toronto, is being considered. Engineer W. O. Wynne-Roberts presented a report on the engineering aspect of the scheme, and suggested that an immediate decision be reached on the question of taking care of sewage and storm water. It was decided to adopt the separate system idea. No action will be taken by the city until a plan of the whole sewerage system has been submitted.

New Express Packing Rules Will Affect Shipments From the States

Aim is to Safeguard Merchandise in Transit and Also to Facilitate the Handling of Shipments

ACCORDING to official notification being sent out by the American Railway Express new packing rules will be put into effect on December 10. This will, of course, affect all parcels and other goods sent into Canada for plumbing merchants and others. As far as the Canadian rules are concerned there will, it is stated at express offices, be no change as the new American ruling is an adaptation of the system put into effect in Canada some months ago. The American Railway Express in its statement says:

This is regarded by express traffic officials as one of the most effective steps taken to safeguard merchandise in transit by express since the unification of the various lines into the American Railway Express Company, which is agent of the Government in handling the express business of the entire country.

The new rules were put into effect to induce shippers to turn their business over to the carrier so that it can, with reasonable care on the part of the express company, be handled properly. The rules will not permit the use of paper wrapping for packages over 25 pounds, nor of ordinary paper boxes, wrapped or unwrapped, when the weight of the contents is over that limit. For shipments over 25 pounds, wooden containers, or fibreboard, pulpwood or corrugated strawboard containers of specified test strengths are required.

This standardization of express rules will place the express service on the same basis as freight, so far as the character of the cartons used is concerned.

Dominion Council of Health Meets at Ottawa

THE Dominion Council of Health at its sessions in Ottawa took up the following matters:

1. Control of venereal diseases, in reference particularly to the Dominion grant towards this object. 2. Measures against influenza. 3. Conservation of child life. 4. Industrial hygiene. 5. Rural hygiene. 6. Habit drugs.

The first subject occupied a great deal of time and plans for fighting venereal diseases by a nation-wide campaign were made.

The council has decided that out of the Appropriation Act set apart by the Federal Government for division among the provinces for the combating of the disease, the sum of $10,000 shall be given direct to the National Council for the combating of venereal diseases in their nationwide campaign of information and propaganda and measures of treatment, and a further sum of $1,000 to be expended by the Federal Department of Health along the same lines.

The balance of the grant, namely, $180,000, will be proportionately assigned to the provinces and the representatives of the provinces assuring the Department of Health that equivalent amounts of provincial funds will be set apart for the same purpose.

The Act provided for the constituting of this council consisting of the Deputy Minister of the Federal Department of Health, the chief executive officer of the Board of Health of each province, and five other members appointed by the Governor-in-Council, and in accordance with the above, the present meeting consists of: Dr. J. A. Amyot, Deputy Minister, chairman; Dr. J. W. S. McCullough, Ontario; Dr. Elzear Pelletier, Quebec; Dr. W. H. Hattie, Nova Scotia; Hon. W. F. Roberts, New Brunswick; Dr. H. E. Young, British Columbia; Dr. Gordon Bell, Manitoba; Dr. W. C. Laidlaw, Alberta; Dr. M. M. Seymour, Saskatchewan; Professor J. G. Fitzgerald, Professor of Hygiene, University of Toronto; Mr. W. F. Stephen, secretary Canadian Ayrshire Breeders' Association; Tom Moore, president Trades and Labor Congress, representing Walter Rollo, Hamilton, the labor representative; Miss Helen R. Y. Reid, convenor of Auxiliaries, Canadian Patriotic Fund, Montreal; Mrs. H. E. Todd, president of the Canadian Women's Institute.

MARKET CONDITIONS AND TENDENCIES

Continued from page 38

actually ended. In the meantime quotations are as follows:

Dealers' Buying Prices—	
Tea lead	0 03½
Heavy lead pipe	0 05¼
Pipe scrap	8 00
Stove plate, per ton	12 50
No. 2 busheling	11 00
Yellow brass	0 10
Red Brass	0 16¾
Light brass	0 07
Scrap zinc	0 06
Heavy copper	0 18
Wrought iron, No. 1, per gr. ton	14 00
No. 1 machinery cast	18 00
Heavy melting steel	14 00
Old rubbers, boots and shoes	0 07
Overseas, lumbermen's rubber boots	0 05
Bicycle tires	0 1½
Automobile tires	0 03

No Changes Made in Waste or Oakum

WASTE AND OAKUM.—These lines remain steady. A very good demand is reported for each. Jobbers do not look for any change in prices at present. Quotations are on the following basis:

	Per 100 lbs.	
Best American	$21 00	$22 00
Clipper, spun		21 00
Do., unspun		19 50
Plumbers' spun	10 00	10 75

WASTE

Cream, Polishing	0 21
White—	
XXX	0 18
XX	0 16¾
X	0 15¾
XC	0 13½
Japanese	0 13
XXX Extra	0 19
XX, grand	0 17¾
XLCR	0 16½
X Empire	0 15¼
X Press	0 14
Colored—	
No. 5	0 13¾
No. 1	0 12¾
No. 7	0 11¾
No. 1A	0 10¾
No. 1B	0 09¾
Fancy	0 15
Lion	0 13½
Standard	0 12
Popular	0 10½
Keen	0 09

Above lines subject to trade discount for quantity.

All Ingot Metals Are Holding Firm

INGOT METALS.—All these lines are holding firm with the exception of lead, which shows a tendency toward advance. Copper is firm at 27 cents a pound and is in fair demand, the other lines show only a fair volume of business. The strike in the United States is still being felt and shows its effect on the trade.

COPPER.—The copper market continues steady at 27 cents a pound. Up to the present, European buyers have not entered the market as expected, and until they do there is no immediate prospect of a change.

LEAD.—Prices of lead show a tendency toward advancing and this is partly a result of the strike conditions. Prices are around 7¼ cents per pound.

SPELTER.—Business is rather quiet in this line. Prices show no change.

TIN is maintaining its position fairly well, but may develop a little stronger tendency now that the strike in England has been settled and shipping will be resumed. Stocks are ample to take care of requirements, it is believed. Tin quotations are in the vicinity of 60 cents. per pound.

ANTIMONY.—The demand for the product is not heavy. Quotations show no change from 10 to 11½ cents a pound.

ALUMINUM.— Comparatively little business is in evidence. Prices are quoted on a basis of 35 cents a pound.

WILL READ THEIR OWN METERS

At a meeting of the Light and Heat Commission Tuesday the secretary outlined a new system of reading gas and electric light meters, on account of so many objections from the residential customers about meter readers going into their premises to read meters.

The commissioners decided to try out the scheme whereby the residential customers will be asked to mark the position of the hands of the meters on blank forms furnished from time to time by this department.

The success of this scheme will depend entirely on the co-operation of the customers.

Market Conditions and Tendencies

STATEMENTS REGARDING SUPPLIES AND TREND OF PRICES

THE MARKETS AT A GLANCE

DIFFICULTY in obtaining supplies with which to go ahead with work is delaying the men in the trade in all parts of the country. The situation in many lines seems to be growing slowly worse and the answer seems to be in lower production and in indirect results of the unsettled conditions in the United States.

Price changes have been very few, but there seems to be a general tendency upward. An advance of thirty cents over the base price has been made in galvanized sheets. Boiler tubes are very scarce, it being practically impossible to obtain some sizes in any quantity. There is every likelihood of an advance here shortly.

Pipe prices are holding firmly with a very active demand and considerable scarcity reported in some lines. There is an acute scarcity also in some lines of valves. Soil pipe and fittings are more plentiful and those who have been hampered in their work by lack of supplies are now able to proceed.

There is nothing to indicate any further advances in enamelware prices, although these goods continue very scarce, especially bath tubs.

The business situation is most satisfactory in every way and many firms have enough orders on hand now to keep them busy until next Spring. With the acute scarcity of housing accommodation, the volume of building steadily increasing and more building than ever before in prospect for next season, conditions generally never looked brighter.

Conditions brought about by unsettled labor conditions in both Canada and the United States and consequent lower production is resulting in a marked scarcity of goods. On all sides complaints are heard from men in the trade who are unable to get the materials they require. While prices are holding steady with one or two exceptions the general tendency is upwards.

In some quarters higher prices for copper are looked for before very long.

Galvanized Sheets Advance Thirty Cents

SHEETS AND PLATES.—An advance of thirty cents over the base price has taken place and a further advance is expected. Nearly all business done of late has been from warehouse stocks, which are now almost exhausted. The general situation in regard to both black and galvanized sheets seems somewhat uncertain. One manufacturer is sending out notice to the trade in which he gives it as his opinion that the main trouble, as far as galvanized sheets is concerned, will come after the strike is over and the mills start operating again. People, he points out, will begin to expect goods, and few shipments will reach them. Quotations are as follows. Some quotations vary from 35 to 70 cents over this base.

BLACK SHEETS—

14 gauge	$5 40 to $5 45
16 gauge	5 50 5 60
18-20 gauge	6 05 6 15
22-24 gauge	6 10 6 20
26 gauge	6 15 6 30
28 gauge	6 25 6 45
3-16 inch plate	4 90 6 25
¼-inch boiler plate	4 40 5 80

Prices shown are for full cases. An extra charge of from 25c per 100 lbs. is made for less than case lots.

GALVANIZED SHEETS.

	Premier	Apollo
10¾ oz.	$8 05	$8 00
U.S. 28	7 75	7 60
U.S. 26	7 45	7 30
22 and 24	7 30	7 15
18 and 20	7 15	7 00
16	7 00	6 85
12 and 14	6 90	6 70

An extra is now charged on galvanized sheets, 10¾ oz. and 28 ga., when shipped out in sheets 3 feet wide. The extra charged over prices shown above is 20c per 100 pounds. Other gauges show no change for different widths.

Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

Boiler Tubes Scarce; Prices Holding Firm

BOILER TUBES. — Although the strike in the United States has almost worn itself out, jobbers, it is believed, are not looking for any great volume of this commodity to enter Canada for a few weeks. Canada depends on United States manufacturers for a considerable supply, it is stated, and will have to conserve till business gets more settled. So far prices have not advanced. Quotations are as follows:

BOILER TUBES—	Per 100 feet Seamless	Lapweld
1 inch	$27 00	.....
1¼ inch	29 00	.....
1½ inch	29 50	.....
1¾ inch	32 00	$27 00
2 inch	31 00	26 00
2¼ inch	35 00	28 00
2½ inch	43 00	32 00
3 inch	48 00	40 00
3¼ inch	.....	47 00
3½ inch	60 00	44 00
4 inch	75 00	56 00

Pipe Not Plentiful; Prices Unchanged

WROUGHT PIPE.—Some sizes of pipe are extremely scarce, and, needless to say, they are the sizes that are in most demand. Jobbers state they are able to get some shipments through and by neighborly obliging of one another, are able to keep their customers partly supplied. The outlook is none too bright for a few weeks, as it is hard to say what the American mills will be able to do. Prices are very firm, with a tendency to advance, although some merchants figure they will remain firm on account of business generally settling down to a more normal basis. The quotations are as follows:

WROUGHT PIPE

Price List No. 40, July 4, 1919

		Standard Buttweld Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
		Per 100 feet			
⅛	in.	$ 6 00	$ 8 00	$.....	$.....
¼	in.	4 53	6 66	5 13	7 26
⅜	in.	4 53	6 66	5 13	7 26
¾	in.	5 99	7 57	6 84	8 42
½	in.	7 53	9 66	8 68	10 81
	in.	11 14	14 28	12 84	15 98
1¼	in.	15 07	19 32	17 37	21 62
1½	in.	18 01	23 10	20 76	25 85
2	in.	24 24	31 08	27 94	34 78
3	in.	50 87	65 03	.....	.....
2½	in.	38 90	49 73	.....	.....
	in.	76 85	97 01	.....	.....

		Standard Lapweld Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
		Per 100 feet			
2	in.	$ 27 94	$ 34 78	$ 31 64	$ 38 11
2½	in.	40 66	51 48	46 51	57 33
½	in.	64 86	81 88	.....	.....
3	in.	53 17	67 32	60 82	74 97
3½	in.	66 70	83 72	75 90	92 92
4	in.	79 03	99 19	89 93	110 00
4½	in.	88 00	113 00	107 00	132 00
5	in.	103 00	132 00	125 00	154 00
6	in.	133 00	171 00	162 00	200 00
7	in.	175 00	224 00	211 00	259 00
8L	in.	184 00	235 00	221 00	273 00
9	in.	254 00	324 00	305 00	376 00
10L	in.	235 00	301 00	283 00	349 00
10	in.	303 00	387 00	365 00	449 00

Terms, 2% 30 days, approved credit.

Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Prices of Brass Goods Show Little Change

VALVES AND BRASS STEAM GOODS.—Prices still hold firm. Reports indicate that European buyers will be

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in the market shortly, in fact, it is stated that the necessary credit arrangements are the main hold-back. However, when they are completed it is the general belief that prices will soar, as it is a well-known fact that copper is extremely scarce throughout almost all of Europe.

Brass valves and some lines of brass steam goods are reported to be scarce. Business in connection with marine work has been fair, although it has fallen off some on account of inactivity in the British Columbia shipbuilding. Other lines, though, are reported to be quite brisk. Market quotations are as follows:

Compression work, standard	35
Fuller work, standard	40
Bath cocks, compression	37
Bath cocks, Fuller	40
Flatway stop and waste cocks, standard	38
Roundway stop and waste cocks, standard	38
Brass steam cocks, standard	Net List
Globe, angle and check valves, standard	5%-23%
Do., removable disc	10%-22%
Radiator valves, standard	15%-23%
Do., removable disc	Net list to 40%
Basin Cocks	
No. 0 and 1, Fuller pattern	40
Compression	30
Quick opening	40

Seasonable Demand For Range Boilers

RANGE BOILERS.—Prices in this line are holding firm and no immediate change in quotations expected. There seems to be a strong seasonable demand. Some jobbers report a scarcity, but most jobbers are able to give fair delivery.

Quotations remain unchanged and are as follows:

Range Boilers	Standard	Extra Heavy
30-gallon	$11 00	$12 50
35-gallon	13 50	15 50
40-gallon	15 25	17 25
52-gallon	20 50	25 00
66-gallon	32 00	38 00
82-gallon	40 00	47 00
100-gallon	50 00	58 00
120-gallon	60 00	67 00

Soil Pipe, Fittings Easier to Get Now

SOIL PIPE, FITTINGS.—The scarcity seems to be easing off automatically, due, no doubt, to the nearing of the end of the season. Although the bulk of these goods are required in the earlier part of the season, the demand is still good. Manufacturers are better able to keep up with their orders, although some claim they are doing more of a warehouse business at present. Prices are unchanged and the general opinion seems to be that they will remain at present levels. Quotations are as follows:

Medium and extra heavy soil pipe, 2, 3 5 and 6 in.	10%
Medium and extra heavy soil pipe, 4 in.	15%
Medium and extra heavy soil pipe fittings, 2 in. to 6 in.	25%
8 in. extra heavy pipe and fittings	5%

PIPE FITTINGS

Cast iron fittings	10%
Plugs	22%
Bushings	25%
Unions, ¼" to 2½"	40%
Do., ⅛", 3" and larger	35%
Dart unions, ¼-inch to 2-inch	25%
Do., 2½-inch and larger	15%
Nipples, up to 4-inch	80%
Do., 4½-inch and larger	70%
Do., running thread 4-in. and under	50%
Couplings, 4-in. and under	40%
Do., 4½-in. and larger	20%

MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittings, Class A, lb.	$0 57	$0 72
Do., Class B, lb. net	0 25	0 35
Do., Class C, lb. net	0 19	0 25

Enamelware Scarce; Prices Hold Firmly

ENAMELWARE is still very scarce, especially bath tubs. Manufacturers claim they have not yet recovered from the Canadian strike which lasted for several months. The enamelled line is in good demand, particularly in some sizes and grades of bath tubs and wash bowls. There are a considerable number of houses, more particularly through the country, that are just being completed, and the builders are ready to install the bath room fixtures. There seems to be no shortage of raw materials, ingots being procurable in Canada. An advance in price is not looked for at present and yet no reduction is expected. Prices on a few of the well-known lines are as follows:

Bath tubs, roll rim, 4. 4½, 5 feet, 24 to 30 in. wide	$37 07
Bath tubs, 5½ ft.	41 27
Lavatories—	
17x10" Apron F139 or P4045	11 00
18x24" Apron F154 or P3845 or P3847.	17 00
18x21" Apron F169 or P4205	12 70
18x21" Roll rim F197, F199 or P4655-6	11 10
17x19" Roll rim F241 or P4345	9.05
Sinks, roll rim, 18 x 30 in.	16 60
Sinks, flat rim, 20 x 30	6.77-6.65
Do., 18 x 30	6.07-6.19
Do., 16 x 24	5.29-5.45
Closets, oak tank and seat	26 50
Do., enamel iron or white vitro tank	30 00

Advance May Be Made In Conductor Pipe

GALVANIZED CONDUCTOR PIPE.—This line still holds very firm. Manufacturers have not taken advantage of the advance in galvanized sheets as was expected, although there is nothing definite to indicate that they will not. The galvanized sheet stocks are nearly exhausted. Some manufacturers were fortunate enough to have sufficient on hand to make up enough stock for their fall requirements. Prices are quoted as follows:

PIPE (Conductor)
Plain

2 in., in 10-ft. lengths, list	8 00
3 in., in 10- ft. lengths, list	9 70
4 in., in 10-ft. lengths, list	12 80
5 in., in 10-ft. lengths, list	17 50
6 in., in 10-ft. lengths, list	21 30

F.o.b. Toronto, Ottawa, Oshawa.
List less 10%.

Bars, Angles, Ties Advance 25 Cents Base

BARS, ANGLES, TIES AND SECTIONS.—Some firms are quoting these from the one base at an advance of twenty-five cents over base prices, the present quotation being $4.25 base. The demand, it is stated, is very brisk on these lines, although it is mostly warehouse stocks that are selling owing to the steel strike, which accounts for the advance.

Lead and Zinc Products Steady

LEAD AND ZINC PRODUCTS.—These lines are steady, although lead has shown an advance of ¼ to ½ cent per pound. Business has been good in both lines and prospects are for continued activity. Present quotations are as follows:

Lead pipe, list, per lb.	....	$0 12½
Lead waste pipe, list, per lb.	....	0 13½
Do., over 8 inches, list, per lb.	....	0 14½
Above subject to discount of 10%.		
Lead traps and bends	....	15%
Lead wool, lb.	0 11	0 12½
Lead sheets, 4 to 6 lbs., sq. ft., in rolls, lb.	0 12	0 13
Cut sheets ½ to ¾c lb. extra and cut sheets to size, 1c lb. extra.		
Solder, guaranteed, lb.	$0 35½	$0 38
Solder, strictly, lb.	0 34½	0 37
Solder, commercial, lb.	0 32½	0 35
Solder, wiping, lb.	0 31½	0 34
Solder, wire, lb.	0 35½	0 41
Zinc sheets, per lb.	....	0 17

No Change in Scrap Market; Still Quiet

OLD MATERIALS.—No shipments of scrap are going across the border and it is uncertain when this business will be resumed. The gradual wearing out of the strike is having the effect of firm prices so far and the general tendency seems upward. This condition, it is expected, will improve at any time upon receipt of word that the strike has

Continued on page 35

FOR SALE—PLUMBERS' SUPPLIES OF ALL makes, at prices that protect the plumber. American Plumbers' Supplies, 14 Craig St. West, Montreal.

BRASS ROD For Sale

At a Very Attractive Price

Free Turning

Round Brass Rod

Mill lengths of the following sizes:—

	Diameter
30,000 lbs... .250"	¼"
24,500 lbs... .533"	Abt. 17/32"
62,500 lbs... .625	⅝"
73,250 lbs... .750	¾"
27,500 lbs... .9375"	15/16"
46,750 lbs...1.000"	1"
45,000 lbs...1.250"	1¼"
26,000 lbs...1.375"	1⅜"
39,000 lbs...2.000"	2"

Above is all new material stored at the manufacturers' plant in Connecticut, ready for prompt shipment and has passed Government inspection.

Box 325, Sanitary Engineer

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Gauges

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for steam, water, air, ammonia, etc., are instruments of the very highest quality and utmost reliability, and are sold under a full guarantee of satisfaction.

They include gauges for every conceivable purpose—for indicating, or indicating and recording—pressure, temperature, altitude, revolutions, etc.

"Morrison's" is seen on most all Canadian Working Drawings and Specifications. You may expect frequent calls for Morrison goods.

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"CRANDON"
Heat Regulators

Plain Thermostat
No. 10

The Crandon No. 10 Plain Pattern Thermostat is designed for use where it is not necessary for a clock thermostat. This instrument should be used where it is desired to maintain the same temperature at night as in the day time.

If it is possible to close off the bedrooms from the rest of the house it is a very desirable instrument to use. In apartment houses and in such places as a steam pressure is maintained during the daytime and lowered at night this instrument will do as well as any, for all that is needed, in this case, is to close the valve when the temperature has reached the desired point.

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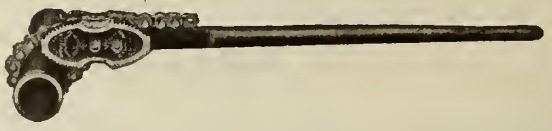

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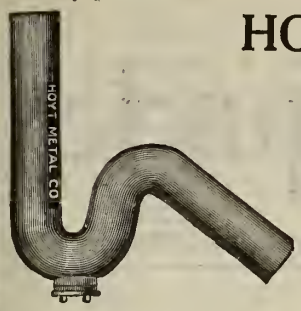

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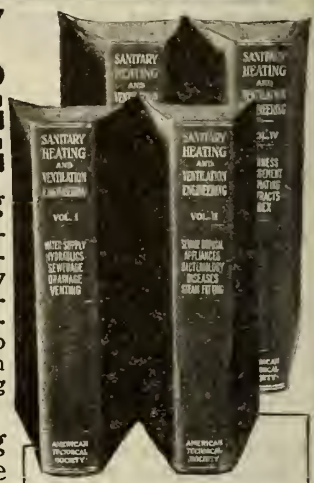

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INDEX TO ADVERTISERS

Allison, Kenneth B. 47
American Technical Society 45
Amherst Foundry Co.....Inside Front Cover
Anthes Foundry, Ltd. 5
Armstrong Mfg. Co., The 48

Beaton & Cadwell 47
Beaton & Corbin 48
Belanger Regd., O. 47
Borden Canadian Co. 48
Buffalo Specialty Co. 1

Canada Metal 13
Canadian Brass Co. 4
Canadian Consolidated Rubber Co. 44
Canadian Society Domestic and Sanitary Heating Engineers, The 6
Canadian Fairbanks-Morse Co. 40
Canadian Tube & Iron Co. 47
Chamberlain Desolvo Co. 46

Empire Manufacturing Co...Outside Ft. Cover

Galt Brass Co. .....Back Cover
Gummer, G. & W. G., Ltd. 2
Gurney Foundry Co. 48

Hamilton Stove & Heater Co. 40
Hause Mfg. Co., Chas. F. 48
Hoyt Metal Co. 41
Hungerford, U. T., Brass & Copper Co... 48

Imperial City Heaters 8
International Malleable Iron Co. .....
Inside Back Cover

Jardine, A. B., & Co. 8

Katie Foundry Co. 41
Kerr Eng. Co., Ltd.....Inside Back Cover

Long & Co., R. G. 46

McDougall & Co., R. 46
Moline Heat 5
Morrison Brass Mfg. Co., Ltd., Jas. 39
Mueller Mfg. Co., H. 37

National Steel Tank & Mfg. Co. 39
Port Hope Sanitary Mfg. Co. 14
Scaife, W. B., & Sons Co. 9
Steel & Radiation, Limited 9
Standard Sanitary Mfg. Co. 3

Taylor-Forbes Co., Limited 11
Trimont Manufacturing Co. 46
Toronto Hardware Mfg. Co. 9

United Brass Founders & Engineers, Ltd. 11

Warden-King, Ltd. 7
Wallaceburg Brass Co. 43
Williams, J. H., & Co. 40
Wolverine Ltd. 41

X Laboratories 45

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No fitter can afford to experiment with his profits. When you get a leaky or cracked boiler job you want to know that you can send any man to that job —have him finish it quickly—otherwise there's the kicking, the arguing and the time-wasting that is utterly useless from a money-making standpoint.

Over 25,000 steamfitters now know that "X" Liquid is the **only** scientific process for repairing leaky and cracked boilers—and for making them LEAKPROOF—RUST-PROOF — AND SCALEPROOF. They know that with "X" they make three times the profit that they could by dismantling and welding.

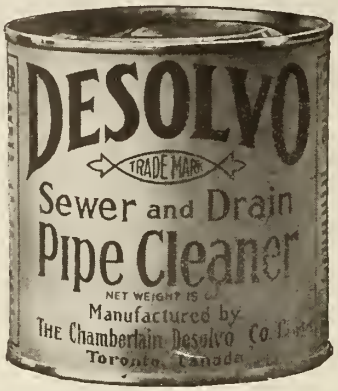
And they wouldn't risk their reputations experimenting with an imitation.

"X" LABORATORIES

636 Washington St. Boston, Mass., U.S.A.

For

Clogged Drains Frozen Pipes



Reason For Big Sales

It saves money, labor bills, tearing up the house and lawn. It clears drains. It mixes with cold water, requiring no heating and generates heat enough itself to thaw frozen pipes.

Order from your jobber

Chamberlain Desolvo Co., Limited
110 Church Street, Toronto

Eastern Representatives: Richardson & Bureau, 55 St. Francis-Xavier St., Montreal, Que. General Office: Pittsburgh

BOB LONG

UNION MADE
OVERALLS
SHIRTS & GLOVES

Known from Coast to Coast

R.G. LONG & CO. LIMITED
TORONTO CANADA

TRIMO

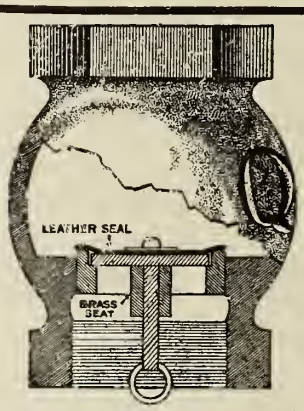
THE WORD TRIMO

Stands for good tools made by the Trimont Mfg. Co., which are the following:—

The Trimo Pipe Wrench
The Trimo Chain Pipe-Wrench
The Trimo Monkey Wrench
The Trimo Pipe Cutter (Hand)

The four good points that make **Trimo Pipe Wrenches** superior are the **Spiral Spring** always in place—**Steel Frames** that will not break—**Nut Guards** that protect adjustment nut—and the **Inserted Jaw** in handle that can be replaced when worn—**Save Money** and buy Trimo goods, made by

TRIMONT MFG. COMPANY
ROXBURY (BOSTON), MASS.



This is a "Q" Foot Valve

And it Just *CAN'T* Leak

There are more pump troubles caused by "leaky" valves than from all the wear and tear which occurs in the average life of a pump.

The "Q" valve will overcome all priming troubles, and water once raised above it, through the suction line, will not leak out.

If you want the pumps you instal to give maximum, you will require to use the only valve on the market that JUST CAN'T LEAK.

Made in sizes from 1 to 8-inch.

R. MACDOUGALL CO., LTD.
GALT., CANADA

WROUGHT PIPE

BLACK and GALVANIZED SIZES, 1/8 IN. TO 4 IN.

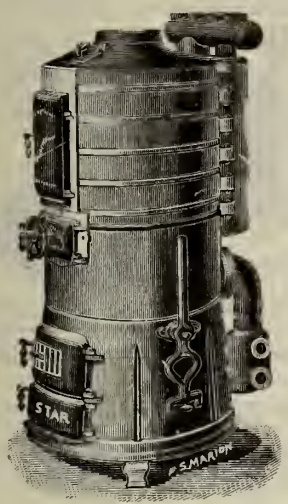
All our pipe thoroughly inspected, tested to 600 lbs. hydraulic pressure and branded.

All Sizes of NIPPLES (Black and Galvanized)

Ask your jobber for CT *Brand of Wrought Pipe*

CANADIAN TUBE & IRON CO., LIMITED, MONTREAL
Works: Lachine, Can.

Thousands of Star Boilers in Use requiring repair Parts



It will be a long time before folks forget the coal troubles of the last few seasons.
The principal feature of the Star Boiler is that **no other round hot water boiler has any coal-saving improvement not embodied in** the "Star."

Then, too, while boiler installation and repair time is here, why not stock up with Star parts, for which O. Belanger has taken over the rights and is now making?

Many thousands of Star Boilers are in use requiring these repair parts hitherto unobtainable.

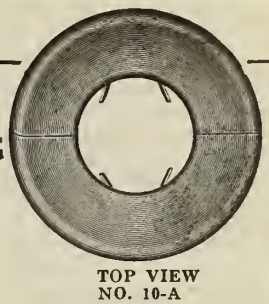
Write to us at once in time to catch the season's business.

We guarantee prompt deliveries.

O. BELANGER, REG'D.
Amherst Street
MONTREAL

OPEN VIEW
NO. 10-A

The CEILING PLATE that's better



TOP VIEW
NO. 10-A

THE NO. 10—A NARROW FLANGE PLATE—IS A STEEL HINGED PLATE. FLANGES ¾" WIDE. HIGHLY FINISHED. ESPECIALLY DESIGNED FOR TWIN CONNECTION "NARROW."

The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

High quality at the right price.

Gem No. 4.

Gem No. 4 Automatic Air Valve

Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

Write for catalog showing our complete line of specialties.

The BEATON & CADWELL MANUFACTURING Co.
New Britain, Conn.

Eastern Agent: J. R. Devereux & Co., 358 Beaver Hall Square, Montreal. Western Agent: A. E. Hinds & Co., Chamber of Commerce, Winnipeg.

Buying at 12c; Selling at 10c

Allpriser Service Prevents It

This handy, annual service shows you where you are by means of exact understandable cost figures. Allpriser means elimination of loss, reduced overhead and a new sense of security against price mistakes.

Allpriser Service consists of a flexible leather bound book 7 x 9, of 150 loose leaf pages. The service includes a list of net prices of all staple articles and a regular service of new sheets revised to the latest changes. Allpriser Service is only $25.00 annually.

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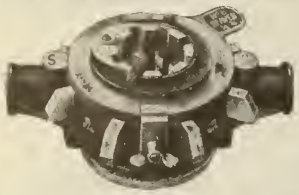
Constant Sales Increase

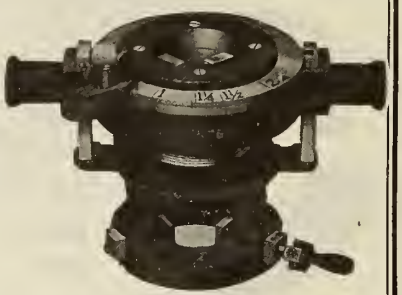


6 Beaverette to ¾ inch.

This efficient little die stock has been about 10 years on the market with constantly increasing sales.

The only tool that threads ¼, ⅜, ½ and ¾ without changing dies or bushings. Two sets of dies are operated by one handle.

Beaver 25 and 26 1 to 2" are alike except that 26 has ratchet attachment. They operate on the Beaver receding die principle—the further you thread the easier the labor. A man of ordinary strength can cut a 2-inch thread with one hand. Together these tools cut ¼ to 2-inch pipe without change of dies or bushings.



No. 25 Plain 1 to 2 inch.

Borden-Canadian Co.

110 Church Street - Toronto

GENUINE

ARMSTRONG STOCKS and DIES

Hinged Pipe Vises *Pipe Cutters*

Pipe Threading Machines

—MANUFACTURED BY—

THE ARMSTRONG MFG. Company

317 Knowlton Street BRIDGEPORT, CONN

248 Canal Street NEW YORK

"BC"

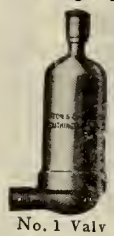
COMBINATION COLD ROLLED STEEL Floor and Ceiling PLATES

Carried by the leading supply houses

No. 15

Puts just the right finish on that heating job

Send for catalog of complete line of "B. & C." goods.



No. 1 Valv

Stock carried by our Canadian Representative W. H. CUNNINGHAM & CO. 183 Church Street Toronto, Ont.

No. 16

No. 17

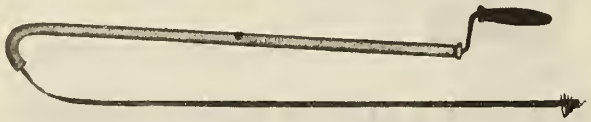
The Beaton & Corbin Mfg., Co. Southington, Conn., U.S.A. The Old Original Company

Chas. F. Hause Mfg. Co., Ltd.

Manufacturers of the

Hause Closet Auger

Seamless brass tube—high-grade 7-16 steel spring. Made with 3-foot and 6-foot springs.



Ask your jobber or write us direct. Made in Omaha, Nebraska, U.S.A.

Canadian Distributors

Empire Mfg. Co., Ltd., London and Toronto

"Star Brand" Seamless Brass and Copper Tubes

including

Iron Pipe Sizes

also

Seamless Brass Condenser Tubes

READY FOR IMMEDIATE SHIPMENT

from our New York Warehouses

Also a complete line of Mechanical Cold Drawn Seamless Steel Tubing

U. T. Hungerford Brass & Copper Co., Lafayette, White and Franklin Sts., New York, U.S.A.

GURNEY-OXFORD BOILERS RADIATORS

FOR HEATING ANY DESCRIPTION OF BUILDING BY STEAM OR HOT WATER

THE GURNEY FOUNDRY CO. LIMITED

TORONTO MONTREAL CALGARY WINNIPEG VANCOUVER

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Pipe Fittings

Made in Canada

The Brand that has the Quality

M Brand Pipe Fittings, etc., give a service and satisfaction that will invariably get you re-orders and much new business as well.

A trial of the goods will prove this claim.

CAST IRON FITTINGS

With this brand mean fittings made with iron of high tensile strength—proper proportions and correct tappings.

RECESSED DRAINAGE FITTINGS

MALLEABLE FITTINGS

With this brand mean fittings made of Air Furnace Refined Iron, reamed and tapped to gauge with perfect threads

Standard and Extra Heavy Flanged Fittings and Flanges. Galvanizing Malleable and Gray Iron Castings of all Kinds.

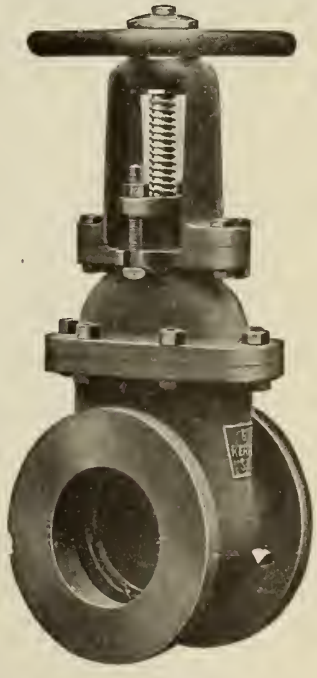
International Malleable Iron Co., Limited, Guelph, Ontario, Canada

There Are Lots of Gate Valves

Advertised and Sold

but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.

Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.

Approved by the Fire Underwriters' Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

Splendid Appearance

EVERY FITTING TESTED

EVERY TANK GUARANTEED

Not a Complaint to our Knowledge

10 Years and More Without a Leak

Made In Canada

Join us in our success by specifying VitrO No-Trouble Tanks when placing your next order of goods with your jobber.

Galt Brass Company, Limited

Galt, Canada

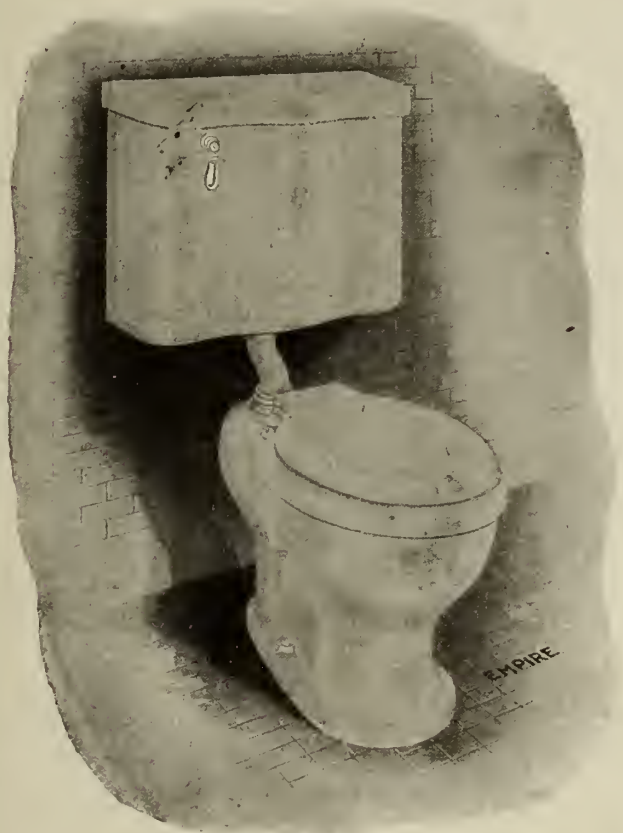
Toronto Office: 67 Adelaide St. E.

Sanitary Engineer
Plumber and Steamfitter of Canada
VOL. XIII. PUBLICATION OFFICE, TORONTO, NOVEMBER 1, 1919 No. 21

"Silentic" Was a Bold Step in Naming

It is a name that stands for a guarantee of silence.

The Empire Manufacturing Company has never fallen down on a guarantee, we never will.



Silentic Plate A 22-D. Empire Vitreous China Double Wavered Lowdown Tank white pyralin coated "Action D" and 2" white pyralin coated offset connection.

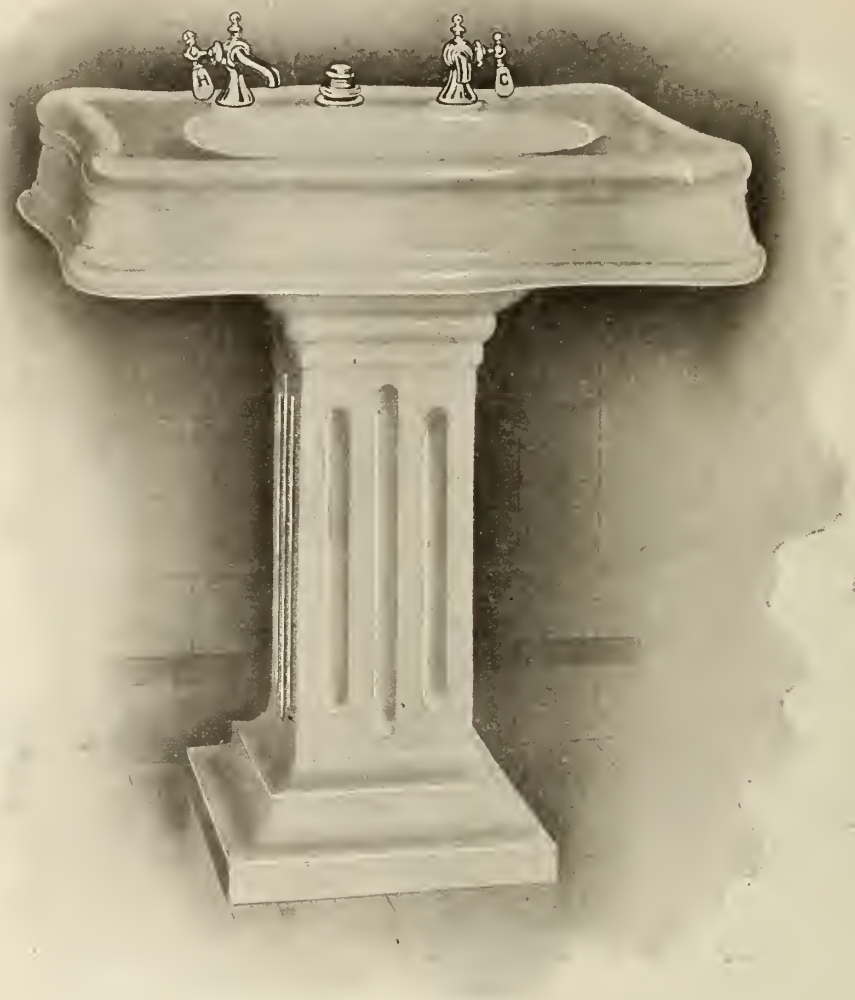
The "Silentic" is as near silent as any sanitary fixture can be. Every sanitary engineer who has installed "Silentics" is ready to back us in our guarantee.

The scores of householders who have enjoyed the freedom from embarrassment, that the "Silentic" makes possible, are our best advertisements.

But silence is not the only selling point of the "Silentic." Note its point of snow-white appearance —no nickle to tarnish and spoil its appearance. Like all our line of plumbing the "Silentic" meets every requirement. All our sanitary fixtures must be absolutely efficient, non-corrosive, durable, *Sanitary,* or they do not leave our factory.

Empire Manufacturing Co., Limited
London and Toronto, Canada

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While



A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for BEAVER BRAND CAST IRON ENAMEL WARE

Amherst Foundry Co., Limited

General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

ONTARIO:
Monarch Brass Mfg. Co., 71 Brown St., Toronto

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E. B. Plewes, 120 Lombard St., Winnipeg

This Helps You Sell Heating Systems

Send for One

IT'S a helpful hint book on heating systems. Not a book filled with text and tables. But one filled with a hundred and one suggestions, any one of which may be just the Happy Solution to some of your heating problems.

Not problems of how to pipe or what size boiler or radiator to use.

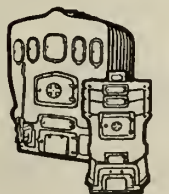
But the help hints for easily overcoming such problems as how to meet some folks' objections to radiators. Or ways of meeting requests for a heating system that ventilates and heats at the same time.

Likewise how to explain in a simple, easy to understand way, why some boilers burn less coal than others.

What we want to do is send you one, as well as one to every one of your employees who you think ought to have one.

Then after you have seen it, send us the names of some of your prospects who you think it will help you to help make a sale.

The name of the book is The Happy Solution.



Lord & Burnham Co. Limited of Canada
Boiler Department
ROYAL BANK BUILDING, TORONTO
Factory: St. Catharines, Ontario

SANITARY ENGINEER, November 1, 1919, Vol. XIII., No. 21. Published 1st and 15th of every month at 143-153 University Ave., Toronto, by The MacLean Publishing Co., Ltd. Yearly subscription price, Canada, $1.00; United States, $1.50; Great Britain and the Colonies, 4s. 6d.; elsewhere, $2.00. Entered as second-class matter at the Post Office Department, Ottawa. Entered as second-class matter July 1st, 1912, at the Post Office at Buffalo under the Act of March 3rd, 1879.

"Standard"
"Perfection" Built-in Baths

Made in One Piece Enamelled All Over

These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in-Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners meaning bathroom sanitation.

Made in 5 and 5½ foot sizes.

Illustrations on request.

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Limited

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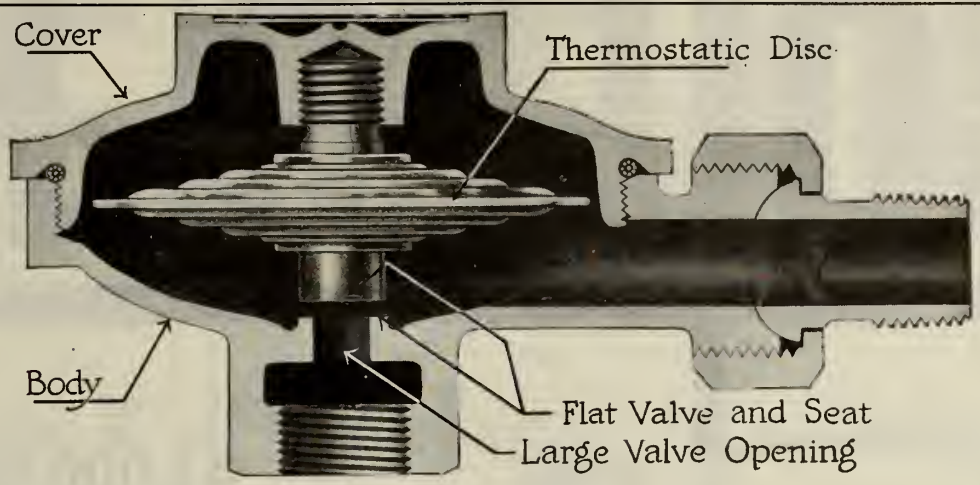
"MADE IN CANADA"



Inside Facts

The cover and thermostatic disc are securely fastened together: therefore there are only two major parts to a Dunham Radiator Trap. The disc is of special composition phosphor bronze, enclosing a volatile liquid which is extremely sensitive to temperature changes over a wide range—10 pounds pressure to 15 inches of vacuum. No adjustments are ever needed: we do that at the factory.

The DUNHAM HEATING SERVICE

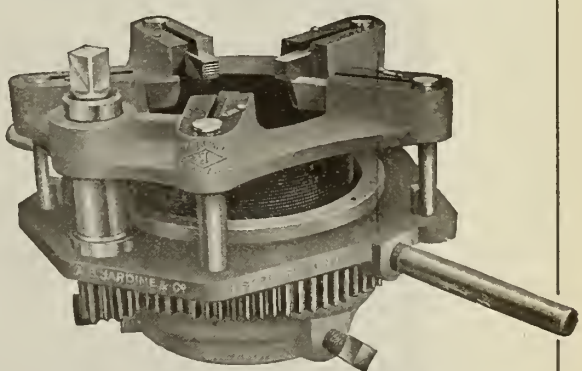
The above illustration shows all of the trap. Note the absence of loose parts in the path of flow: there are no sliding contacts, nothing to gum up, no guide or pin. The valve seats squarely. No wonder that the efficiency of the Dunham Radiator Trap equals its simplicity.

The complete details will interest you

C. A. DUNHAM COMPANY, LTD., TORONTO, ONTARIO

Halifax Ottawa Vancouver Montreal Winnipeg Calgary

JARDINE and TOLEDO PIPE THREADING TOOLS



"Toledo" Geared Adjustable Threading Tool
No. 2 ½. Capacity 2 to 6 in. inclusive.
Weight 120 lbs.

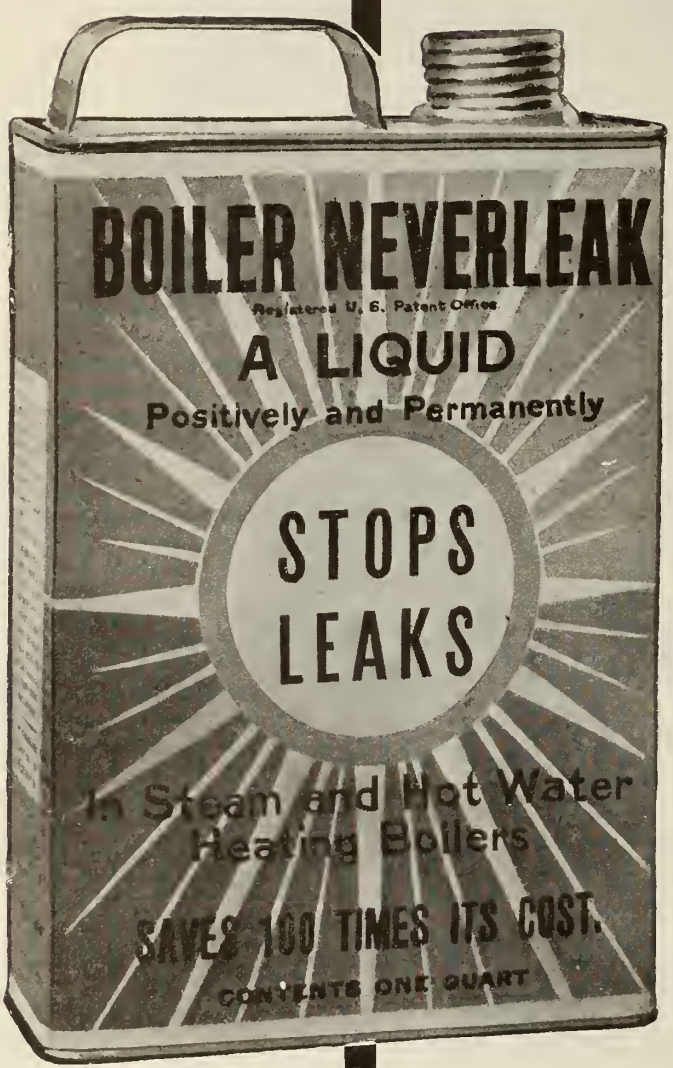
THE ratchet feature of Jardine and Toledo Tools permits their being used to thread pipe which is already in place, no matter how awkward it may be to reach. The Jardine and Toledo have no cams or jim cracks to get out of order; and the dies only cut with the mouth of the cutter. Also, as the tool advances on the thread the dies open out so as to make the proper taper. This means there is no friction on the pipe and every ounce of strength is used in making the cut, so saving time and labor. These are only a few of the valuable features of these tools.

SEND FOR CATALOGUE

A. B. JARDINE & COMPANY, Ltd., HESPELER, ONT.

Sole makers of "Jardine" Pipe-Threading Tools.
Sole licensees to manufacture and sell Toledo Pipe-Threading Tools in Canada.
Agents, Winnipeg and West—Stanley Brock, Ltd., Winnipeg, Man.
Brockville and East—J. R. Devereux, 358 Beaver Hall Square, Montreal.
Belleville and West—W. H. Cunningham & Co., 183 Church St., Toronto, Ont.

BOILER NE



$1,000,000.00 GUARANTEE

If Boiler Neverleak doesn't do all that we claim for it and More, if it doesn't positively, permanently and quickly stop leaks in any hot water boiler or steam-heating boiler (below water line), if it proves unsatisfactory in any way, we will promptly refund your money or replace the goods, free, entirely at your option.

Could Anything Be Fairer?

Neverleak Expe

VERLEAK

You Will Eventually Use Boiler Neverleak! Why Not Now?

Experiments are costly. Our advice is DON'T MAKE THEM! You will save yourself a lot of worry and trouble by starting **at once** to use Boiler Neverleak, absolute Champion of all stop-leak compounds for use in hot water and steam heating boilers. Don't take our word for this; ask Boiler Neverleak users.

Just stop and read this **$1,000,000.00 guarantee** which assures you success with

BOILER NEVERLEAK

"If Boiler Neverleak doesn't do all that we claim for it and **more,** if it doesn't positively, permanently and quickly stop leaks in any hot water boiler or steam heating boiler (below water line), if it proves unsatisfactory in any way, we will promptly refund your money or replace the goods, free, entirely at your option."

You don't take one particle of risk! Boiler Neverleak makes good so consistently that it has practically revolutionized the repairing of leaky hot water and steam heating boilers. This marvelous liquid works almost as if by magic. Just think, all you need is a pipe wrench and a can of Boiler Neverleak to repair the toughest leak. You can easily

Make $50.00 In One Hour's Time

It's being done every day. Let us prove it to you. Send for further information telling about our special offer of **One Quart Can Free.**

Buffalo Specialty Co.

Neverleak Experts for 25 Years

352 Ellicott St. Buffalo, N. Y.

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Pneumatic and Storage Tanks

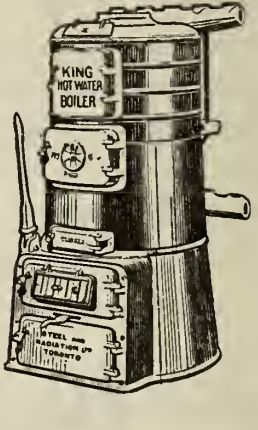
The Factory that builds a perfect tank

Send for prices and discounts.

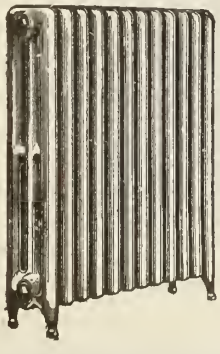
NATIONAL STEEL TANK AND MFG. CO.

BRADFORD, ILLINOIS, U.S.A.

Recommend an Efficient Heating System to Your Customers



Character in a Heating System, like character in a man, is not fixed by any one quality. It is an aggregate of many qualities, and the value of the final product depends upon how well each and every one of these varying factors is assembled in the finished product.



KING HOT WATER BOILERS AND IMPERIAL RADIATORS

Considered as a whole, King Hot Water Boilers and Imperial Radiators possess these attributes in the highest degree, and are backed by a policy of manufacture which has developed and maintained this character for every product bearing our name. The result is "built-in" quality. Your customers will be perfectly satisfied with a King Hot Water System.

STEEL AND RADIATION, LIMITED

Manufacturers of Hot Water *and* Steam Boilers *and* Radiators; Fenestra Steel Sash *and* Concrete Reinforcing

Head Office:—Fraser Ave., Toronto Sales Offices:—Montreal, Toronto, Quebec

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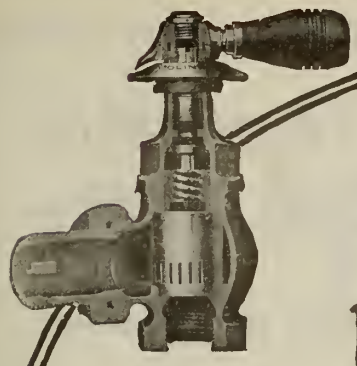
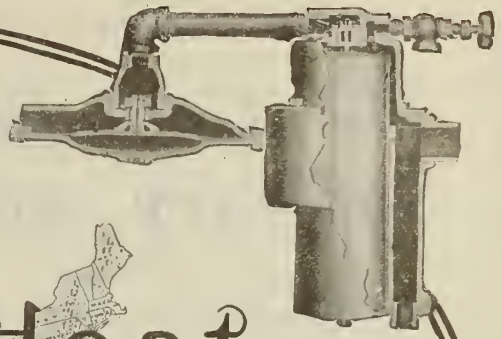
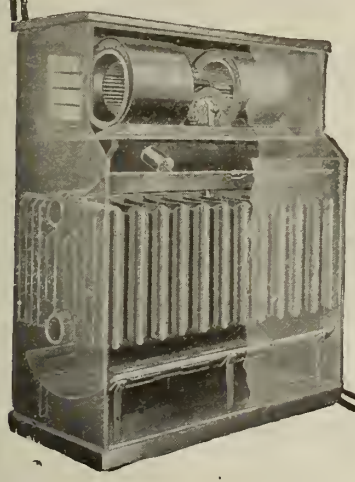
A complete stock of all lines is carried at our Montreal warehouse.



A GOOD LINE
of Equipment for
YOU to sell—



Moline Heat
EVERYWHERE



Moline Heat — System of Steam Circulation and Control
UNIVENT — Last Word in Combined Heating and Ventilating
"LIVE OUTDOORS—INDOORS"
Liberty Draft Controller — and other products

Write for Complete Line of Catalogs TODAY

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THE MODERN HEATER

Hot Water Heating by Steam

We furnish plans and specifications for Heating and Ventilating Schools and Public Buildings. Central Heating Plants for Groups of Buildings. Laundry and Kitchen Equipment.

Some of the installations we have made, list of many others on application :

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We solicit enquiries from Architects

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Every man, firm and corporation engaged in the Plumbing and Heating business throughout the Dominion of Canada owes that duty to themselves first, and to their brother craftsmen second.

The need of an organization of this sort is so obvious that no great amount of argument should be necessary with a broad-minded man of business.

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Frank R. Maxwell
President

Address all Communications to
GARRETT F. FRANKLAND, Sec.-Treas.
Room 303, 2 College St., Toronto, Ont.

U. F. O.

A Little "Straight Talk" to the Canadian Plumbing Trade

TWO weeks ago the Ontario farmers sprang a surprise on this political province; in fact our rural friends were somewhat stunned at the results themselves. In this great victory at the polls, what is the lesson to be seriously taken to heart by ourselves and every Sanitary Engineer in the province? Simply this — that the farmer must not longer be considered as an individual who could not or would not appreciate modern conveniences and sanitation as we would. They have demonstrated their ability at organization in the recent election. They have shown their desire for education and pleasure, thoroughly, on an equal footing in the matter of provincial administration. Let us take up the challenge and determine to bring his needs and comforts as close to our trade as that of the city dweller. At the moment we may not need his patronage or goodwill, but the opportunity exists just the same and the time is coming when that vast field will increase our opportunity one hundred fold.

Yours for Efficiency and Service,

TRADE B.O.T. MARK

THE CANADIAN BRASS CO.
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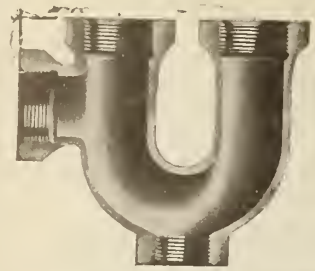
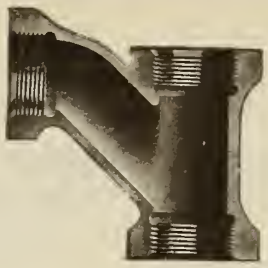
GALT, ONTARIO

CANADIAN BRASS GALT ONT

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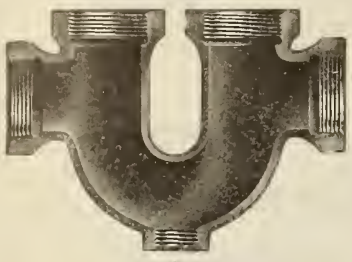
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The most popular Fittings for modern sanitary installations

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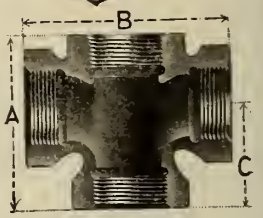

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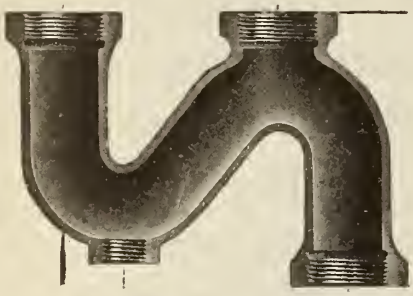
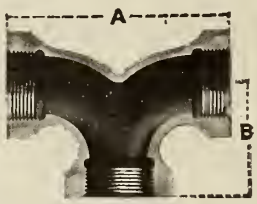

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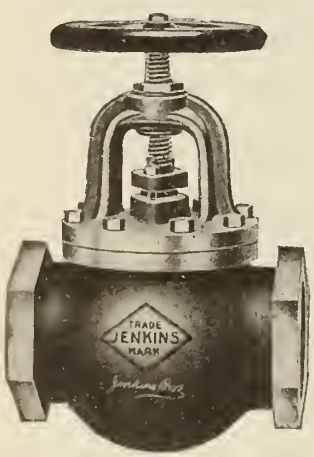

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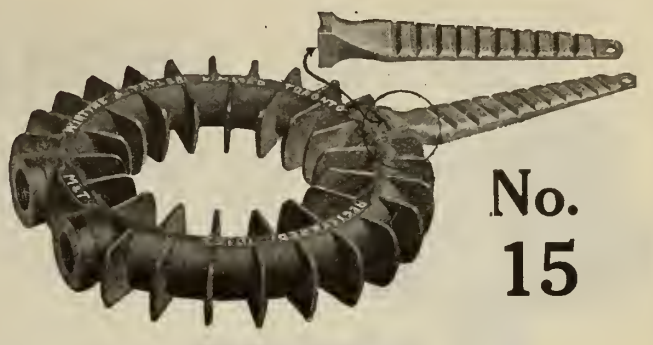

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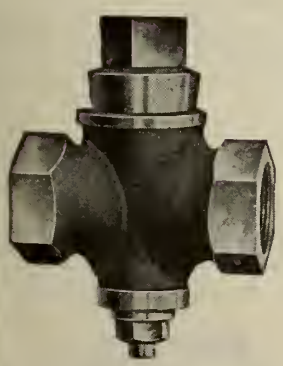

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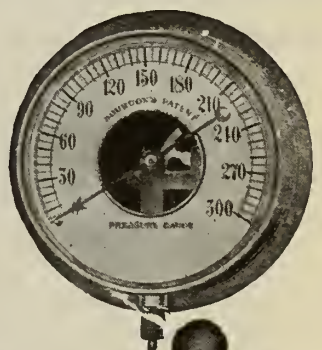

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QUATURN
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Its neat, artistic appearance - sells it
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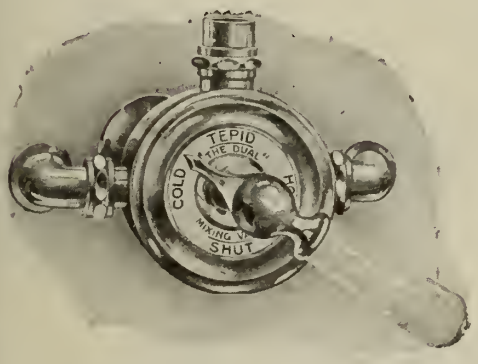

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Cold Water must be turned on first, no possibility of scalding.

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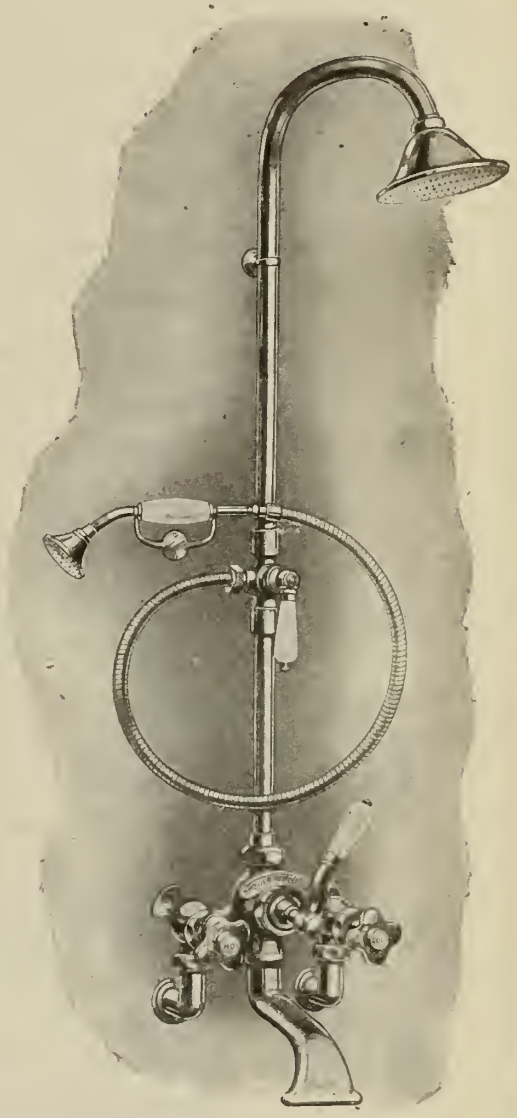

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SANITARY ENGINEER
PLUMBER AND STEAMFITTER OF CANADA

ESTABLISHED 1907 — PUBLISHED TWICE MONTHLY

Vol. XIII. — TORONTO, NOVEMBER 1, 1919 — No. 21

CONTENTS

"Don't be Afraid to Take on New Lines" 17-20

Mechanical Features of an Office Building 21-23

A New Heating System 23

How to Arrange Your Advertising 24-25

Editorial Comment 26-27

News From Here and There 28-30

Ontario Executive Visits Border City 31

Buying at Home Will Build up Your Home Town 33

Heating and Ventilating 34-36

Fifteenth Article of Series on Practical Heating 35

Ventilating the Modern School 35-37

Market Conditions and Tendencies 38

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Published on the First and Fifteenth of Each Month

GEO. D. DAVIS, Manager.

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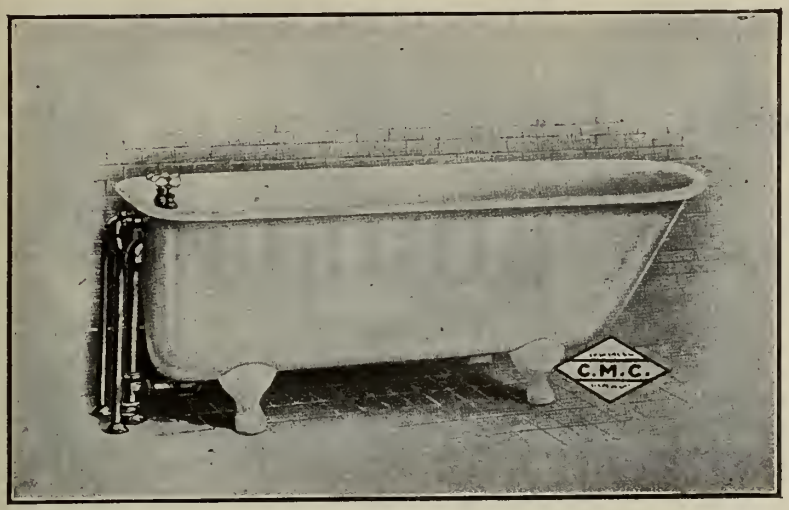

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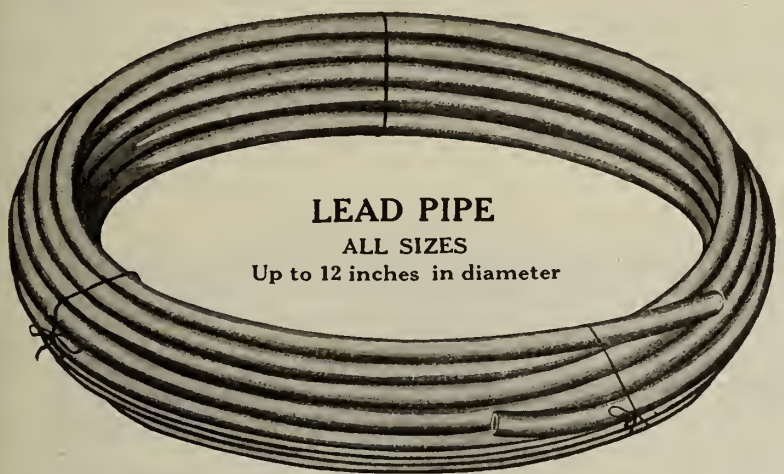
C.M.C. Products have been on the market for over 30 years. The Canadian Plumber has come to recognize them as "last word" in superior service and dependable quality.



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THE CANADA METAL COMPANY, LIMITED

TORONTO, CANADA

HAMILTON MONTREAL WINNIPEG VANCOUVER

Port Hope Sanitary Manufacturing Company, Limited

ROUGHING-IN BOOKLETS

Plumbers will find our new Roughing-in Booklet a great help on jobs where they wish to accurately install the piping system, without having the fixtures delivered to the buildings until they are ready for the finishing work.

The Booklet has been carefully compiled, a line drawing is given of every fixture made by the company and exact measurements are shown in clear and legible form.

Copies may be obtained by writing any of the Company's branches or from the jobber from whom you purchase your enamelware.

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MONTREAL SHOWROOMS
234 Beaver Hall Hill

Established 1907 Circulates Throughout Canada

Sanitary Engineer
Plumber and Steamfitter of Canada

Published First and Fifteenth of Month

Vol. XIII. TORONTO, NOVEMBER 1, 1919 No. 21

Don't be Afraid to Take on New Lines

Walter Brittain, of Bloom & Brittain, Hamilton, Ont., Tells How the Firm Has Multiplied Its Business Many Times—Finds Sales of Electrical Goods Steadily Increasing—Discusses Trade Problems

Based on an interview by C. E. PARSONS, of Sanitary Engineer, with Walter Brittain, of Bloom & Brittain, Hamilton, Ont.

TEN years ago Walter Brittain and Harry Bloom started in the plumbing business in Hamilton in a modest way. To-day they have two places of business and their turnover each year runs into really large figures which are still growing.

"I guess we grew because we were not afraid to take a chance and go into new lines," said Mr. Brittain, in discussing the matter with SANITARY ENGINEER. "We are still following in the same line. There is only one stipulation. We must see that there is a demand for whatever line of goods it is, and they must be goods that we can stand behind. We do not want to handle anything that is not going to give good service and good satisfaction to the party who buys it. If we did we would quickly get the wrong kind of advertising, because nobody talks louder or more persistently than the man or woman who pays good money for something that turns out unsatisfactorily. On the other hand, we have no better advertisement than customers who are satisfied.

The Firm's Motto

Long ago we adopted as our motto or our business policy the slogan: "The customer is always right." If, at any time there is even the slightest question about anything we take the stand that the customer decides the matter. If he thinks he has an article that is in any way unsatisfactory all he has to do is to bring it back and we will make it right and give him another. The same policy applies in regard to our plumbing and heating work. It has got to satisfy the customer. His word is final. The people all over the city and district know that we stand behind this policy

This display is located right up at the front of the Bloom and Brittain store. Note the splendid condition the stock is kept in, the attractive display of bathroom fixtures and the neatness of the show room.

The illustration shows an interior view of one of Bloom and Brittain's show windows and also the very front of the shop. Note the display of bathroom fixtures in the window, the neat arrangement of stock and the attractiveness of the show room.

and it has helped us to build up the trade we now enjoy."

Got Good Results

Mr. Brittain stated further in reference to the firm not being afraid to take on new lines that one of their first departures from the plumbing and heating business was to stock stoves. From that they have gone into electric stoves, aluminum ware, electric utilities, toasters, heaters, vacuum cleaners and washing machines. In addition to electric washers they carry a complete stock of washers operated by hand, water and gasoline power.

"No matter what line you are in," said Mr. Brittain, "it pays to carry the stock. People like to deal at a place where they can get a good selection. They like to see a lot of goods out about the store and they like to see it kept in good condition. Women particularly are apt to keep away from shops where they have to step around piles of merchandise and they will not handle goods that are not kept clean. It doesn't matter whether it is a display of bath tubs, bath-room fixtures, electric washers, stoves or anything else, it is good business to keep it out where people can see and inspect it and keep it clean and nice."

Cuts Down Overhead

"We soon found that handling other lines than plumbing goods not only brought a lot of people to our shop for both the other lines and plumbing goods, but the steadily increasing turnover made for more profits and at the same time cut down our overhead. We could do many times the business we had been doing when we only sold plumbing goods, and with litle increase in expense. We have been adding one line after another and at the present time would go into the handling of electrical fixtures if we could find a man to take charge of the work upon whom we could thoroughly depend."

Take All Discounts

Mr. Brittain pointed out that the firm's stove business has grown so big that they now buy by the carload. They buy for cash and they sell as nearly as possible on a cash basis. By doing business in this way they effect a material saving in the way of discounts and minimize all losses due to collection of credit accounts.

In connection with the selling of stoves, Bloom and Brittain keep half a dozen stoves for demonstration purposes only right up at the front of the store. These are combination stoves that will burn either coal, wood or gas. They are kept in perfect condition, the nickel shining brightly and all parts clean, so that any woman who comes in may, if she wishes, handle the stoves and see for herself just how they work.

Keep Them Separate

"The reason we keep several stoves for demonstration purposes," said Mr. Brittain, "is that we have found that it is bad business to interrupt a salesman who is trying to sell a stove. If we have half a dozen customers in at the same time and only had one stove to show, the customers would start talking to one another and the salesmen would get mixed up. In short, when selling stoves you must concentrate on the customer. Any interruption from outside sources disturbs both the salesman and the customer and may result in the loss of a sale."

Take Old Ones in Exchange

Mr. Brittain stated that if a party comes into the store and wants to buy a new stove and wants something allowed on an old one, that the firm always takes the old one.

"We handle from 450 to 500 stoves every year," said Mr. Brittain, "and in the course of our business we get a number of old ones. We fix them up and make a good profit out of them, in fact we frequently make as much out of an old stove as we do on a new one. We put them in good shape and have no trouble whatever in turning them over."

In connection with the trade in used stoves, Bloom and Brittain have fitted up a special section in the basement, where they are kept on display. All are neatly arranged and are kept in good condition.

Are Easily Handled

The department where the used stoves are rebuilt and fixed up generally is located on the third floor, up out of the way of everybody. In order to facilitate the handling of stoves and heating equipment generally, the firm has a

freight elevator which will take them to the basement or to any floor desired. Most of the stoves are mounted on wheels and are quickly and easily moved to the place desired.

Just how big a business Bloom and Brittain do in stoves may be gauged from the fact that they have sent out as many as 33 combination ranges in one day.

Bring Good Results

Mr. Brittain says that demonstrations are put on frequently and always bring good results. These are well advertised and very often the firm co-operates in its efforts with some leading woman's organization, which puts on a sale of cooking in connection with the stove sale. Some of the demonstrations last as long as two weeks. Others are shorter.

"Results vary," said Mr. Brittain, "but they are always satisfactory. The whole thing seems to depend on the weather. If the weather is such that people will naturally think about stoves or whatever we are demonstrating, we will probably sell twice as much goods as if the days are of the variety that people are outside and not thinking about heating equipment."

Helps Sales Also

Another thing that helps stove sales in Hamilton, Mr. Brittain says, is the gas situation. Sometimes there will be trouble with the natural gas supply, especially in zero weather, and there will be a rush for heating stoves.

"We thoroughly believe in advertising," said Mr. Brittain. "We get excellent results always. By arranging our demonstrations so that we are working with some local women's organization we also get a lot of business. Recently we put on a two weeks' demonstration, and during that time co-operated with the Women's Exchange, an organization through which Hamilton women sell anything they wish to sell. Naturally this brought a great number of women into the store, and they were easy to interest in stoves, washers and other lines."

In connection with the sale of stoves the firm makes a charge for setting up all stoves, unless they are purchased during the special demonstrations.

An auto delivery is a feature of the store service, and Mr. Brittain says it has proven most satisfactory in every way, not only to the firm, but to customers.

"We simply would not be without it," he said.

Other Demonstrations

Occasionally the firm puts on a demonstration of aluminumware and inserts a coupon in its ads. to be returned to the store with the name and address of the party.

"This gives us a new mailing list every couple of months containing perhaps 500 names," said Mr. Brittain. "We follow these up and many of them are prospects for other goods."

During the year four demonstrations of washing machines are put on with excellent results.

As stated above, the model laundry is a feature that is a real talking point when it comes to closing business.

Steadily Growing

The firm is doing a steadily increasing business in electric stoves and washers.

"We find the demand for electrical goods increasing all the time," said Mr. Brittain. "The goods sell themselves. Take washers for instance: We have no hesitation in allowing people whom we know to be reliable, to take home an electric washer. In practically every case the machine sells itself and they never come back. People like electrically-operated equipment, because it more than does the work claimed for it. The equipment works quickly and efficiently and economically. These are three big points that the buyer gives important consideration to. In addition he or she likes to have a nice-looking utility, and few lines are better or more attractively finished than the electric devices. On all the lines that we sell we give a guarantee that as far as I know is the broadest of its kind in Canada. It is simply following out our general policy that holds good in all departments that the customer has to be thoroughly satisfied."

Aggressive Policy

"We believe in an aggressive policy," said Mr. Brittain. "The business man who sits still and waits for trade to come to him, may get by, but if he hustles he will get many times the turnover. In our electric vacuum cleaner business we keep four men going about the city all the time demonstrating and selling. We get excellent results, and very often obtain prospects for other goods."

The firm not only sells stoves and ranges from now on, but during the summer months does a big trade in summer stoves and in coal oil heaters and gas plates. During the proper sea-

This model laundry, located at the rear of the store is proving a big business getter for Bloom and Brittain and is a centre of real interest for housewives who are interested in getting away from the drudgery of washing. The equipment is all connected up and can be demonstrated instantly.

Tomorrow!
THE "BIG DAY"
"BLOOM & BRITTAIN'S
16-18 Macnab St. North
Household Efficiency Exhibition!
The most practical demonstration ever held in Hamilton! Specially approved and assisted by the Ontario Board of Health, Ontario Organization of Resources (Women's Institutes), Good Housekeeping Institute of America, and the Women's Exchange. Perfected mechanical devices which save time, labor and money for the housewife—and DOUBLE the efficiency of the servant. Come and see them in action!
The "Simplex-UNIVERSAL" Combination Range
OHIO TUEC ELECTRIC CLEANER
Permanently Solves the Cleaning Day Problem!
To-Morrow's Schedule
The Machine That Really Does ALL the Hard Work
"COFFIELD" ELECTRIC WASHER
Don't let the purchase price of any of these devices stand in the way of buying NOW! You'll actually be saving money—and we will extend accommodation re payments where required.
Bloom & Brittain, 16-18 Macnab Street NORTH

Bloom and Brittain are not afraid to use newspaper space. The original of this illustration was 15 inches wide and twelve deep. The firm state that they get excellent results from their ads. and frequently use full pages. Note the attractive arrangement, the use of cuts and the punchy sales talk.

sons these lines are kept prominently displayed.

"We sell about 400 plates every season," said Mr. Brittain. "We get the business by advertising and by store and window displays. The merchant who sticks his goods back in a corner and waits for the public to come in and ask for it is working on the wrong plan. To sell stuff you have to let the people see it and let them know you have got it to sell."

Business Is Good

Mr. Brittain says business in the plumbing and heating lines has been excellent. The firm makes a specialty of looking after factory work, and as Hamilton is a big factory city, they have had any number of excellent contracts. The city has, in common with many other Canadian cities, an acute scarcity of dwellings. This has resulted in a great many people with large homes converting them into duplexes, apartments or family flats. Bloom and Brittain have undertaken a great many of the plumbing and heating contracts for these.

"One thing we have kept away from," said Mr. Brittain, "is the speculative builders. They are, as a rule, out to get something cheap. We will not cut prices for anybody, and we do not want any cheap jobs. As a rule, work of this kind would reflect back on our standing, because when the installation commenced to give trouble as it surely will sooner or later, the buyer would say we did the work and would never, if he lived to be a thousand years old, give us another contract. We do not want that kind of advertising. It is bad for business."

Range Boiler Troubles

Mr. Brittain discussed the trouble that is frequently with range boilers, and pointed out that this is a serious matter for the master plumber and runs into quite a loss. It frequently happens, he states, that after a range boiler is installed that it is defective. This means that the firm has to lose all the time its workmen have put on the job and also the time it takes to put in a new one.

"It is not a fair deal on the part of the manufacturers," said Mr. Brittain, "to send out goods which are guaranteed and turn out to be defective. I think the trouble is caused by the kind of ma-

(Continued on page 25)

At the right of the picture is shown part of a battery of electric stoves, all ready for demonstration purposes. Note the battery of washers, the display stands of electric utilities and aluminum ware and the many attractive show cards on the walls.

Mechanical Features of an Office Building

Oil Fuel and Complete Equipment Make Power Plant Unusually Interesting to Engineers

The Welfare of Office Employees Has Been Well Taken Care Of.

By W. F. SUTHERLAND
OF POWER HOUSE

THE modern type of office building erected to-day for the use of industrial firms and business men has little in common with those formerly built. Aside from the excellent working conditions with which the occupant is surrounded a greater degree of interest in his or her physical well being or comfort is manifest. One of the most excellent examples of this type of office building is that of the Imperial Oil Co., on Church St., Toronto, where a gymnasium, a squash court, shower baths, etc., have been incorporated into the building design for those who wish to use them. The mechanical features of this plant are also of more than passing interest to the engineer, for it is seldom that a power plant reflects the attention to detail appearance seen in the present instance.

Heating Plant

Heating is done by a combination of direct radiation and the plenum system. Direct radiation is used for all the main offices, while for basement rooms, squash court, gymnasium, etc, etc., and for the lavatories warm air is supplied by air washing and heating apparatus of the usual type made by the Carrier Air Conditioning Co. of America, 39 Cortlandt St., New York. The usual tempering coils, air washer baffles and main heating coils are fitted and the fan is driven by a 5 h.p. Sprague variable speed motor. The spray pump is driven by a smaller 2.5 h.p. Peerless Motor. Fresh air is drawn in from the roof through a fresh air duct and after being humidified and warmed is distributed throughout the building where required by a plenum chamber and the usual air ducts.

The air temperature is regulated by automatic temperature controlling apparatus made by the Power Regulator Co., New York. Thermostats are located on the incoming cold air side of the tempering coils and also on the outgoing side of the main heating coils. These serve to control the temperature through remote controlled valves on the main steam lines. A uniform temperature is thus secured at all times, no matter what the condition of the air outside.

As mentioned above direct radiation is employed for the heating of the main offices, etc. The Dunham vacuum sysem, installed under the direction of the C. A. Dunham Co., Ltd., Toronto, is used and the excellent arrangement of the piping vacuum and feed pumps, together with the Fisher regulators, will be seen from Fig. 2. Two Blake and Knowles vacuum pumps are employed, each being fitted with a Fisher regulator as shown. These pumps are 8 x 8 x 12 in size and discharge into a hot water receiver above the feed pumps. This receiver is fitted with a float actuating the steam valves on the feed pumps so that they are only running when there is water in the receiver. When the receiver is empty the pumps automatically cut off. The feed pumps, of which there are two, are of the Worthington duplex type, 5½ x 3 x 5 in. in size.

Boilers

For the supplying of steam to the heating system and also to take care of the future power load if an isolated plant is ever thought desirable, two Heine boilers of 195 B. H. P. each are installed in a double setting. These boilers are fitted with circulating blow-offs, etc., and the breeching is carried over to a steel stack 3 ft. 6 in. diameter, which is carried to the roof in a brick well. The pressure carried at present is 65 lbs. with provision made for an increase to 125 lbs. when power is generated in the future. This pressure is reduced to a proper value by means of a Fisher reducing valve.

The boilers are oil fired and the installation presents many features of interest. Perhaps the most noticeable feature to the casual visitor is the extreme cleanliness of the plant in general. The floor throughout is of red tile and the entire absence of ashes and other dirt always present when coal is used makes it easily possible to keep the boiler room, and the apparatus installed in it, spick and span.

Four Simplex oil burners, two to each boiler, are installed. These burners are made by the Standard Oil Burner Co. of Oakland, Cal. Each burner is fitted with a one-half horsepower direct current motor, which serves to drive the blower for air supply and gear type oil pump, both mounted on the motor shaft. The oil pump pumps direct from the oil tank and the surplus over that which is allowed to flow through the regulating valve, flows back through a return header to the oil tank.

The whole mechanism is mounted on a swinging plate

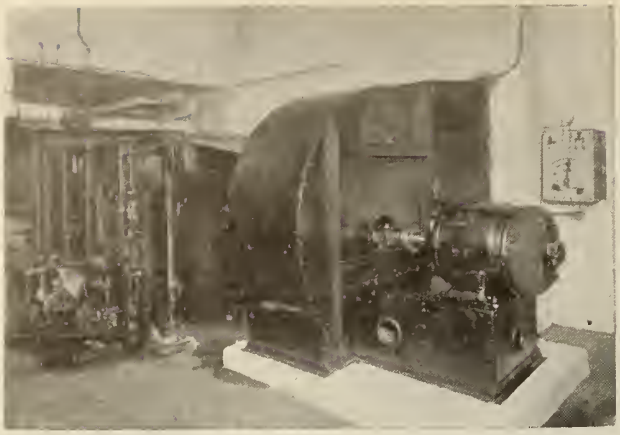


FIG. 1—CARRIER AIR CONDITIONING APPARATUS.

hinged to the boiler front so that when the burner is cut off it can be swung away and the elliptical hole, shown in Fig. 3, closed with a plate. This prevents injury to the burner from the incandescent brickwork of the connection chamber. Each motor is fitted with a starting rheostat and knife switch, this equipment being mounted on a marble panel adjacent to the boiler front.

Electrical connection is made to the motor by flexible conduit and the oil connections are made through a special union which permits the burner to swing easily through the necessary angle. Fig. 3 shows the front elevation of boilers and the different positions in which the burners are shown enable their details to be made clearly visible.

The oil tank supplying fuel oil to the burners is placed three feet below the basement floor and is capable of holding 2,015 Imperial gallons of oil. It is 15 ft. long by 5 ft. diameter and is provided with dished heads.

A small coal fired heater and a hot water tank are provided for the furnishing of hot water to wash basins, shower baths, etc.

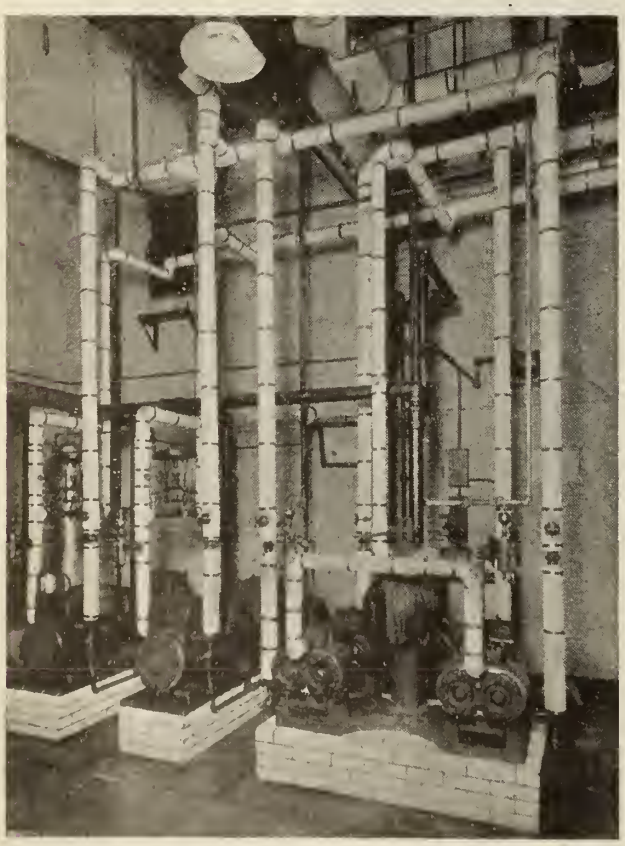


FIG. 2—BOILER FEED AND VACUUM PUMPS, NO. 1 DUNHAM VACUUM HEATING SYSTEM.

The drinking water is all filtered and cooled. Two sets of Loomis-Manning Filters, installed by the Loomis-Manning Distribution Co., Philadelphia, are used. These serve to render the water sparkling, clear and free from any contaminating influence. From the filters the water passes to a cooler operated by a small York vertical two cylinder ammonia compressor. This compressor is driven by a Westinghouse 5 h.p. d.c. motor. A Worthington single stage centrifugal pump driven by a one h.p. motor circulates the drinking water through the system. By keeping the water in constant circulation, it is always at the proper temperature at the faucets and no water need be run off to waste on account of its being too warm. The drinking water faucets are entirely separate from wash basin faucets, and the piping has no connection with the lavatory supply.

In connection with the wash basins throughout the building, it is interesting to note that they are fitted with special faucets made by The H. Mueller Mfg. Co., Ltd., Sarnia.

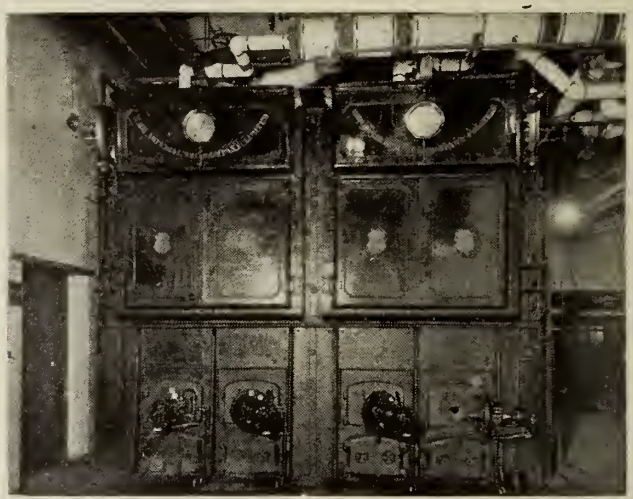


FIG. 3—BOILERS SHOWING OIL BURNERS. THE ONE ON THE LEFT IS IN RUNNING POSITION, THE TWO MIDDLE ONES SHUT DOWN AND SWUNG OUT, AND THE RIGHT-HAND ONE SWUNG CLEAR AROUND TO EXPOSE FIRE HOLE.

These work on the self-closing delayed principle so that they can be adjusted to remain open for any length of time desired. By this means the basins can be filled to any depth desired without danger of flooding and without the necessity of keeping the faucet open by hand as is the case with all other self-closing faucets.

Two fire pumps are installed, each of the two stage type made by Worthington, and each driven by a Sprague 7½ h.p. d.c. 230 v. motor. These pumps serve to fill two tanks on the roof of the building and are arranged for automatic or manual operation. The starting mechanism is unusually complete and the switchboard, of Cutler Hammer make, in addition to the control apparatus for the motors, is fitted with tank indicators and bell alarm.

A low voltage storage battery system is installed and furnishes control for the automatic feature of the fire pump installation, high and low water alarm, elevator signal lights and other features of a similar nature.

Two duplicate 18 volt batteries are installed and a one h.p. Sprague motor-generator set is used for charging. The battery switchboard carries battery charging switches, generator circuit breaker ammeters, voltmeters and the usual feeder circuit knife switches.

A marble distribution board also forms part of the electrical equipment. Energy for power and lighting is obtained from the central station through a 110/220 volt d.c. service. This board presents a very neat appearance through having all the fuses mounted on the back and only the knife switches showing.

Mr. Maxwell Mongraw is Chief Engineer, and Geo. Bains, Plant Superintendent.

The installation of this power plant was done by W. J. McGuire, Toronto.

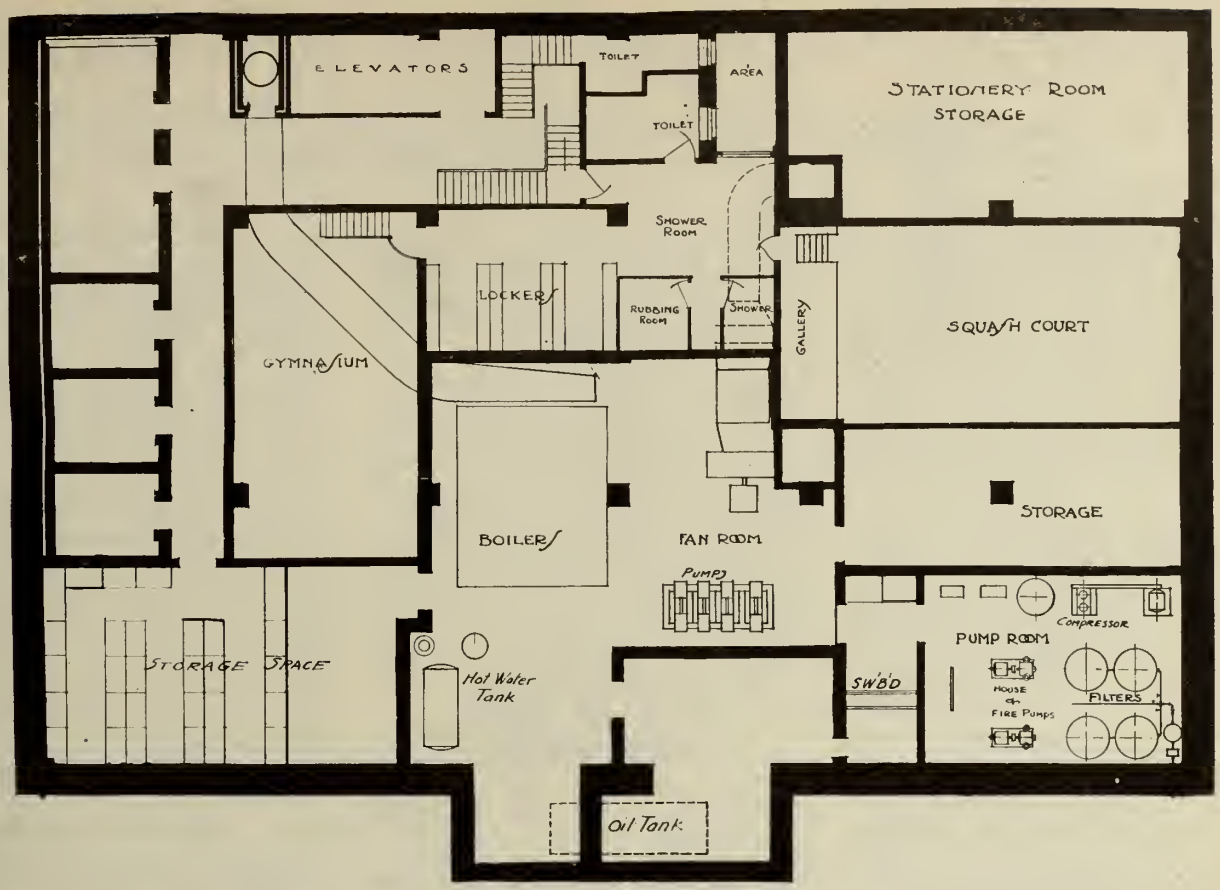


FIG. 4—BASEMENT PLAN SHOWING POWER PLANT EQUIPMENT AND OTHER FEATURES.

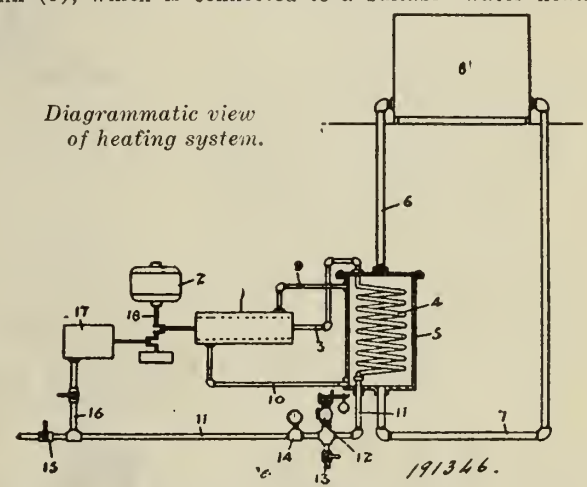
A New Heating System

A NEW heating system of considerable interest forms the basis of a recent patent issued to Robert Cairns, Chief Engineer of the Farmers' Dairy, Toronto. The accompanying illustration shows in diagrammatic form the principle of the system as outlined in the patent specifications.

The principle feature of the invention consists in the novel method of heating a circulating medium by the compression of air by electrical means and the passing of the compressed air through suitable radiating coils to convey the temperature to the water of the circulating heating system, and to utilize the reduced temperature compression for other purposes, or to expand the air to relieve the consumption of electrical energy in initial compression.

The air compressor (1), which can be of any suitable type, is operated by an electric motor (2). The compressed air is carried from the outlet of the compressor by a pipe (3) to a radiating coil (4). This coil is enclosed within a tank (5), which is connected to a suitable water heating

Diagrammatic view of heating system.



system of the circulating class by the pipes (6) and (7). The heat of the compressed air passing through the coil heats the water in the tank, which rises through to pipe 6 to the radiators and returns by pipe 7. The heat of this compressor is further utilized by the connection of the water jacket of the compressor to the tank (5) by means of the circulating pipes shown. A pipe (11) leading from the coil (4) is provided with an adjustable safety valve (12), which may be regulated to relieve at different pressures, and below the safety valve a drain cock is provided which will allow condensation to be drawn off.

A suitable pressure gauge is arranged in the lengths of the pipe and cut-off cock cuts off the pipe (11) from an extension which may be connected to any suitable apparatus which it is desired to operate by compressed air.

A branch pipe (16) leads from the pipe (11) to a re-expanding cylinder (17), which is connected with the shaft

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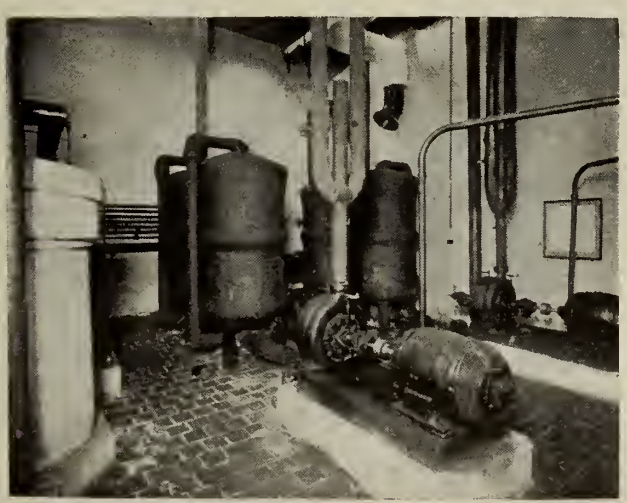


FIG. 5—SHOWING FIRE PUMPS AND FILTERS FOR COOLING WATER.

How to Arrange Your Advertising

Always Consider the Point of View of the Customer — Many Firms Always Feature the Price in Plain Figures—Use of Proper Illustrations is Important

SOME merchants have a gift in the matter of laying out advertisements, and in saying exactly the right thing to catch the public attention. There are others, and undoubtedly this is by far the larger class, who find the make-up of an advertisement one of the difficult tasks, a task that for that reason is often relegated to some spare minute that is hoped for, before the actual need for the writing of the advertisement arrives.

As a matter of assistance to those who find it difficult to get anything to say to introduce themselves, or their store or their goods to the public, the following may prove useful, and a perusal of the advertisements reproduced offer suggestions that are practical, and may be adopted with profit in arranging your own copy.

Start A "Drive"

Advertise one thing at a time if your space is limited. You will leave a definite impression that way. People know you sell other things, and if you do that you will stand as good a chance as the biggest store in your community.

Your strongest line of display should be at the top of your advertisement—or a little above the centre. And your headline should be strong enough to give an appearance of strength to the top of your advertisement.

Use A Good Margin

Use a good margin every time. It is not a waste of space. Margin is breathing space for type. It sets out your message. It makes your advertisement stand out from the page. It makes your message easier to read when it is noticed. It forms a frame for your type picture.

Some of the most notable advertising successes in the country have been built up on small space. A small advertisement intelligently planned is worth two large ones constructed on the principle of the dominance of big space.

But simply a promiscuous use of white space is worse than none at all; scattering it all around without ar consistency will retard rather than aid the readability of your message.

Keep Them Short

Keep your headlines short, or they won't be headlines. Six words is the golden length. And always make sure that you get some gray into your advertisements by writing a bit of matter between your headline and your item.

Making an advertisement attractive is important; but what is advertised is much more important than how it is advertised. That's why so many good looking "ads" fall down—and why so great a number of apparently inartistic advertisements bring results.

BLYTH---is the Man
---to solve your Plumbing and Heating Difficulties---and solve them to your complete satisfaction
Blyth Service Means---
The Undivided Attention
An Up-to-date Plant
Largest Stock of Materials
Efficient Working Staff
The Best Results
Expert in Direct Charge of all New Work
Charges Based on Service Given
IT IS OUR BUSINESS TO MAKE YOUR HEATING PLANT 100 PER CENT EFFICIENT AND YOUR PLUMBING A MODEL
J. T. BLYTH
358 FRANK STREET

Note the points J. T. Blyth of Ottawa emphasizes in telling about the service he is prepared to render. The original ad. was 8 inches wide and 10 inches in depth and made an attractive and striking display.

Have You a Little "Doggie" or a "Kitty" in Your Home?

then it's some job sweeping up the hairs, isn't it?

But why make it a job? Don't you know the HOOVER Electric suction Sweeper is guaranteed to sweep up the most vexatious clinging hairs—also threads, lint, etc—in the twinkling of an eye—without a bit of hard broom sweeping on your part.

Guaranteed also to beat out the imbedded grit that the "missus" misses despite all her muscle.

Guaranteed also to prolong the life of your rugs.

Don't invest a cent in any Vacuum cleaner until you see what the Hoover will do. It is the biggest selling cleaner in the world because it does things that other cleaners will not do.

Only The HOOVER $5.75 will put a Hoover in your home!

Beats . . .

as it Sweeps

as it Cleans

Let Us Show You the Hoover

Cowans

81 Colborne St.

PLUMBING COWANS BRANTFORD ELECTRIC

"The Store With the Blue Front"

This is the way Cowans of Brantford, Ont., boost the sale of electric vacuum cleaners. The original of this ad. was 6 inches wide, and 11½ inches deep. Note the firm's trade mark in the night-hand corner. This is always used in their ads.

Get Customer's View

Desirability and seasonableness are half the battle. Take the customer's side when selecting merchandise to be advertised. Many stores work themselves into a frenzy trying to force unseasonable or undesirable merchandise—its only claim for publicity lying in the store's desire to be rid of it.

Don't spend money telling about the unattractive side of your store. A bargain once in a while isn't a bad thing for a store, but you can go on doing it day after day—legitimately—and make money. And you can't get people to think you are in business for your health.

Some one once said: "Advertising is used too much as a cathartic and too little as a food." There's a lot in that. Use advertising to tell of the finest things in your store—not of its least desirable.

Must Use Judgment

The man who has the proper merchandising perspective of a store is the most valuable factor in that business, and if that store's publicity is successful he is the man to whom most of the credit for increased business should be given. The difference between merchants is the difference between their merchandising perspective. The real advertising man—and often he is the proprietor himself—knows what to play up, and which department ought to take a back seat for the moment.

What People Wanted

If you have seen a "homely" advertisement, and found out later that the store than ran it had a big day's business, you can bet your life that there was something in that advertisement that supplied a human want. The designer of that advertisement might have gotten his types mixed—but he evidently had the big thing right; he advertised what people wanted—and his message carried conviction through its earnestness, even if it broke the laws of artistic display.

Tell Them Something

Before displaying an advertisement effectively make sure that your message is right; that you are telling about something that people want—rather than what you want to get rid of. Making an advertisement good-looking won't add pulling power to a message that lacks incentive to move the readers to action. The reader wants to know "What is in it for me?"—and you'll have to write from his side of the fence.

Consider This

Too many advertisements are planned by artistic standards alone. That

Plumbing, Heating and Electrical Work

Get my Prices on any one of these lines of work. I give you an exact cost of work complete so thrt there will be no bill ofextra items going to you after the work is complete.

We specify all fixtures to be used so that you know what you are getting.

At present we are busy, but not to be too busy to give you a price on any work you may want done.

We have a good line of electrical fixtures in stock and there is no need of sending your money to out of town concerns when you can buy right in your own town.

No Job TooSmall
None Too Large

Fred Uncles,
Plumbing, Heating and Electrical Contractor
Phone, 195 Newcastle, N. B.

Here is an attractively arranged and convincing talk, that will interest all those who have any work of the kind mentioned. The illustration is half the size of the original.

is not to be construed as an attack on perfectly displayed advertisements. It is meant to point out that little things are often allowed to outweigh the big considerations in advertising. The most beautiful advertisement in the world will fail if the wrong merchandise is featured.

Has An Advantage

Did you ever stop to think that the bigger a business gets the harder it is to maintain the personality that attracted its first following? Smaller merchants have a much simpler advertising problem than the big store. When the proprietor of a smaller store signs his name to his advertisement his public can see his very person loom up in front of them as they read his message. They know him personally and if he stands for something in his town his word is powerful and his waste circulation, due to folks who are skeptical of advertisements, amounts to virtually nothing.

Don't Try Frills

Above all be yourself in your advertising. Don't pose, be natural; talk about your merchandise instead of about yourself.

The use of "boxes" can be overdone, too. A box here and there in an advertisement will emphasize and direct attention to those items which you want brought out. But all boxing is no boxing.

Use of Borders

The principal function of the border is to unify the various elements of your advertisement—to hold it together. It should not attract atention to itself. The border is to an advertisement what a frame is to a picture. You want folks to look at the picture—not at the frame.

The border must blend with the type picture. It must be in keeping with the thing advertised, and in "tone" with the rest of the store. If the border is the the first thing you notice in an advertisement it was not chosen with discrimination, and it is detracting from the message. You are not selling border: attention should be concentrated on what you are saying.

Don't be afraid to study the ads. of other merchants and of the department stores, as you can often get many excellent ideas that you may adopt.

Electric Heater For Summer Use

Heat Your Water By Hydro at Little Expense

During the hot weather the problem of heating water is easily solved by the new electric heater. Easily attached and costs little to operate

Electric pump and Hand Pressure Systems also installed.

Phone No. 3255 at our expense.

Chas. West

244 Queens Ave., London, Ont.

This is the way Charles West of London, Ont., goes after business in a town located in a farming district thirty miles north of London. The ad. is one-half the size of the original.

Illustrations Are Always Useful

Especially if the cuts are good. They brighten up an ad and people always like to see a picture of what is offered. They also like to know the price, and many of the best firms in the country invariably feature the price in larger type than the body matter.

DON'T BE AFRAID TO TAKE

(Continued from page 20)

terial they are using now. We seldom had these troubles with the old boilers.

Suggest New Ones

Bloom and Brittain have a staff of eighteen workmen. They do a great deal of repair work all over the city and district.

"When we are called to a repair job," said Mr. Brittain, "our men are instructed to make an investigation, and if the part that is to be repaired is past repairing, to point out the weakness to the owner and suggest that a new part be installed. If we are satisfied that the repair will not, owing to conditions, give every satisfaction, and the owner refuses to put in a new part, we will make the repair he wants, but on the distinct understanding that we do not guarantee the work. We generally find, however, that once a party understands that a new piece means permanency, and that fixing up the old one simply means more trouble later, that he is only too glad to accept our recommendation."

Apprentice Problem

Mr. Brittain regards the apprentice problem as one of the most acute things with which the trade in general has to deal. As far as his firm is concerned it has for the present, at least, given up any idea of training apprentices.

"If the unions would let us alone," said Mr. Brittain, "we would be in a better position. I think that as far as the trade as a whole is concerned, the policy of the unions at the present time is a short-sighted one. If we could retain control of the apprentice until he was out of his time, as used to be possible under the old indenture system, it would help solve the problem. But as things are now, if a boy comes to us he is of little use for the first year or so. Then he begins to get the hang of things and we send him out. The union takes control of him and demands more money than he is worth. The result is that we are not training any apprentices, and if this is carried on generally, where are the plumbers of the future coming from? The men who are doing the work now are not going to live forever, and someone should be ready to take their place."

Co-operation Essential

Mr. Brittain spoke of the good work that is being accomplished as a result of the men in the trade in Hamilton co-operating. They are, he says, making steady progress. They are not only working to solve their own local problems, but with the Ontario organization and the Dominion organization to solve provincial and national problems.

"The only way to get anywhere is to work together," said Mr. Brittain. "As long as men who are engaged in the same business and who have the same interests pull away from one another, instead of together, they are not going to get results. The master plumbers in this city are finding that out. They are realizing as never before just what it means to them to get together and work out our common problems. We hold regular meetings and at them we have practical talks on trade matters and on business matters. Such things as overhead and business management are taken up and some of the boys are seeing things in connection with running their business that they never knew anything about before."

Eliminating Troubles

There have been local problems to settle in Hamilton just as there are in most cities or districts. Mr. Brittain states that the master plumbers and the local plumbing inspector are working together well and getting things in good shape. The city by-laws, in regard to plumbing, are being improved. At the present time the Board of Health has no jurisdiction over the inspector, who works under the direction of the Building Inspector. The master plumbers are working to have the Plumbing Inspector's Department work with the Board of Health, believing that this is directly in the interests of the citizens as a body.

EDITORIAL COMMENT

FINANCE MINISTER'S WARNING

THE new Minister of Finance, Sir Henry Drayton, speaking recently on the subject of the 1919 Victory Loan, emphasized the very important fact that the late war had not only been a fighter's war but a producer's war. The soldier had been indispensable to the producer; but the producer had also been indispensable to the soldier. "The fighters have finished their work, and written the name of Canada most high," he said, "but the work of the rest of the community is not finished; they are the last of the participants to be discharged. The war will not be won until we all make good the pledge to clean up the war mess, honestly, fully and fairly."

Everyone should understand that if these pledges are to be fulfilled, the 1919 Victory Loan must be pressed through to success. The Finance Minister also dwelt on the absolute necessity of a heavy subscription if Canada's markets are to be maintained and built up abroad. The importance to the Canadian producer of the overseas credits, which depend wholly on the success of the Loan, cannot be too frequently insisted on, for the matter is one of vital concern to everyone. Canada can only seize her present trade opportunities in Europe, and face the future with confidence, if these credits are continued; and the only way to assure that result is to pile up big subscriptions for the Victory Loan.

THE COAL STRIKE

ALL Canada is intimately concerned with the walkout of 500,000 miners of bituminous coal, which has been ordered for to-day. The miners have chosen this time for a walk-out well as there is a world-wide shortage of coal. Their demands involve a sixty per cent. wage increase and a reduction of working hours to thirty per week, that is a five-day week of six hours per day. On the face of it the demand seems most unreasonable and looks like a barefaced attempt at extortion. It remains to be seen whether the American Government will allow the nation to be held up by the miners or not, and the developments will be watched with the keenest interest all over Canada, as we are dependent upon American mines for the great part of our supplies. The coal strike will be far more of a menace to the country than the steel strike, because it not only affects industrial life, but the health and comfort of the people. If the demands should be granted, and there seems to be little possibility of this, prices of fuel will be so advanced that big increases will have to be made in a great number of products and public suffering from high cost of living will be further added to. This is inadvisable, especially at a time when business men the country over are doing their best in the interests of trade to get prices stabilized. Should the strike be a prolonged one, trouble is looked for in operating railways and steamship lines, and the entire world trade would be seriously interfered with.

THE RETAILER CRITICIZED

THE Montreal *Star,* in a recent editorial, slates the Retail Merchants' Association for its opposition to the methods of investigation adopted by the Board of Commerce.

"It has seemed to the *Star* for some time that the Association is inclined to labor under the delusion of persecution. If the retail merchants of Canada have been more closely quizzed than has any other class of Canadian business men in the Government's endeavor to throw some light on the cost of living puzzle, it is only because their business gives them special information the Board requires. As a class they have not been the victims of more loose accusations of profiteering than others.

"As a matter of fact, the Association has been badly advised from the start in its attitude of opposition to the Government's inquisitorial methods. Because it did not approve of the constitution of the Board it objected to giving evidence before it; it still protests against being examined by the Board, and, at the same time, it wonders why this refusal is misunderstood by the public."

While the *Star* is ready to admit that "the retail merchant is no more guilty of profiteering than any other member of the community," it sees in its attitude to the Board of Commerce an excuse for the contrary belief.

Granting a judicious attitude of mind on the part of the public, this contention might be correct. Unfortunately it is impossible to believe in such an attitude, and the public takes the Board of Commerce investigation as an accusation of guilt and certainly there is little in the methods that the Board has adopted to date that would tend to disabuse their minds of such an impression.

PROTECTING THE PEOPLE

ON another page will be found an account of the findings and recommendation of the jury which investigated the tragedy at Ottawa, in which, as stated in a previous issue of SANITARY ENGINEER, seven lives were last by asphyxiation from illuminating gas. It seems a pity that seven lives had to pay the penalty before the authorities had it brought to their notice so forcibly that their civic by-laws were lacking. Action is being taken now to remedy the trouble and prevent further occurrences. The Ottawa case is only one of thousands which exist all over the Dominion. There are any number of menaces to health and life. The men in the plumbing and heating trade are keenly interested in seeing that these are removed. Unless they take action nothing will be done in the majority of cases because the people at large do not understand the seriousness of the matter or what should be done to provide for their safety. The men in the trade should co-operate with the Boards of Health in their towns and districts and also with the recently organized Federal Board. If things are wrong and a menace to the people, it is only by taking action that they can be remedied. If the local authorities are indifferent in the matter, as they very often are, the matter should be reported to either the Provincial or Federal authorities. It sometimes takes courage to do this, especially in the face of opposition at home, but by doing so lives may be saved and serious outbreaks of sickness prevented.

THE INDUSTRIAL PROBLEM

THE vital point about the industrial problem is not the rate per day or week, but the rate per unit of production. Efficient labor is worth high wages. But the man who demands high wages without giving efficient production in return not only injures himself but numerous other people. Suppose for instance, he is making a plumbing line. If he gets high wages for poor work he increases the cost of the goods. That means that the man who lives in Halifax or Winnipeg or Vancouver or any other place in the Dominion has to pay more for his bath tubs, his furnaces, or whatever the line may be. He will be forced to demand more for his own labor and then up goes the cost of whatever he is making to the man who is making hardware. This thing has been working out all along the line until everyone has been hit and it has not been good for business. Business has been good but it would have been better if this condition had not prevailed. There is little question that hundreds of thousands of dollars' worth of building is held up. Any number of individuals have been holding back buying in the hope that things would be cheaper. The average employer knows that it is to his interest that his employees shall be well paid. The higher the wages the higher the purchasing power of the people, but the employee has an obligation to be efficient. Unless he realizes this, he is going to injure business and himself eventually.

JUDGE GARY'S STRONG POINT

THE position taken by Judge Gary, head of the United States Steel Corporation, in favor of what is termed the "open shop," is based upon equality of rights and freedom of action without any class distinction and it seems unfortunate if the American Federation of Labor, particularly after the experiences it has been having with foreigners, is not prepared to accept it. Judge Gary expresses a "fixed opinion" that there should be no arbitration or compromise for settling the American steel strike, because he believes in the open shop principle, that every man, whether a member of the union or not, should have the opportunity to engage in any line of legitimate employment on terms and conditions agreed upon between employee and employer. He states that he has no objection to labor unions for a common interest and believes in the means of consultation and reaching satisfactory terms between employers and those employed. He will not, however, he says, have a powerful outside organization, with more of a centralized autocratic power than one of individual rights, exerting dictation or control over employers in various lines of industry. This stand, he claims, is the very basis of democratic government, of government for the people by the people. Admitting fully that laws that may have been framed in the past, either for national government or for bodies of men in various trades, may have become obsolete owing to changing conditions, he holds that the remedy lies not in violation of the existing laws, but in their revision, always keeping in view the principle of equal rights. Constitution and laws are necessary to such a system, he holds, and without them any country will drift into the chaos that has demoralized Russia. Judge Gary intimates that he is fully prepared to stand firm in his attitude indefinitely, because he believes it is the only basis on which permanent relations between capital and labor can be worked out.

ANYTHING that is desirable is advertisable and the way to sell more is to tell the people about it and that they can get it at your store.

* * *

SLOW moving lines will often eat into the profits of half a dozen fast sellers and a dead department in what is otherwise a live store means waste in distribution and increased costs.

* * *

NEWSPAPER advertising for the retailer brings greater returns because you can talk to more people in less time and at a more resonable cost through the newspaper than in any other way.

News from Here and There

CONTRIBUTIONS OF NEWS GLADLY ACCEPTED

Business Changes

TORONTO.—E. Lee has purchased the plumbing business of W. R. H. Daniels.

Tenders

T. L. Church, chairman of the Board of Control, Toronto, will receive tenders until November 18 for the supply and delivery of water meters.

New Firms

Charles Reid, plumber, has been registered at Montreal.

E. Lusignan & Co., plumbers, has been registered at Montreal by Mrs. Camille Lusignan.

Incorporations

The Canadian John Wood Manufacturing Company Ltd., capital $200,000, head office Toronto, plans to manufacture range boilers and similar lines.

Trade Notes

The Standard Plumbing and Heating Co. of Halifax, N.S., has discontinued business.

Beck & Heavyside, plumbers, have been registered at Montreal by James Beck and John Heavyside.

A pipe galvanizing plant to cost $35,000 is being erected by the Canadian Allis-Chalmers Company at Toronto.

Obituary

The death occurred at his home in Burlington, Ont., of Adam Clark, aged 75. He had been in the plumbing and heating business in Hamilton for 42 years. He was a native of Perthshire, Scotland, and came with his parents to Canada nearly 70 years ago. Soon after learning his trade he established himself in business, in 1877, carrying it on so successfully that his premises had to be enlarged from time to time, so that, at the time of his death, he had one of the most extensive in the district.

Mr. Clark was of a retiring disposition, devoted rather to his home than to public life, and during his long career he took no part in civic affairs. He was an enthusiastic Mason, being identified with Doric lodge, and a member of Central Presbyterian church.

Mr. Clark is survived by his wife and three sons, W. J. Clark, Norman Clark and Fred G. Clark, all of Hamilton.

The death occurred at Brockville, Ont., on Tuesday, of Dr. A. L. Macaulay, for the past nineteen years Medical Officer of Health for the town. He was 56 years old.

MUST UNDERGO OPERATION

Archibald J. Mackmin of Toronto will have to undergo an operation in a Toronto hospital as a result of injuries he sustained while playing baseball during the summer. In one of the games between Toronto and Hamilton teams a player ran him down, and it is believed broke a cartilage in his knee. Mr. Mackmin has been incapacitated ever since.

ADAM TAYLOR OF GUELPH IS SERIOUSLY INJURED

Adam Taylor, secretary-treasurer of the Taylor, Forbes Co., Ltd., at Guelph, Ont., was seriously injured by falling from a second storey window at his home. After being taken to the hospital he lapsed into unconsciousness, and for a time was in a very critical condition. On Monday he underwent an operation and latest reports indicate that his condition is favorable.

SITE SELECTED FOR SEWAGE DISPOSAL PLANT FOR PETERBORO

City Engineer Parsons of Peterboro, Ont., has returned after a trip to various points in the United States where he obtained much information regarding sewage disposal plans. He made an exhaustive report on the matter to the council regarding plans in Fitchburg, Mass., and Schenectady, Albany and Rochester, New York. The Council did not decide upon a system, but passed a resolution to procure the 35 acres of A. Wilson's farm in Otonabee on which to erect the plant.

MUST HAVE SAFETY VALVES

The city council at Quebec City has passed the following by-law concerning safety valves on private drainage:

"The proprietor of every building that shall be erected in the future, in the City of Quebec, shall place on his private drainage, in a place designated by the city, an automatic safety valve approved of by the City Engineer.

"The proprietor of every such building, if he wishes to connect the drainage on the roof of said building with the private drainage, shall make such connection between the safety valve above mentioned and the street sewer.

"Whoever infringes the present by-law is liable to a fine not exceeding forty dollars for every infraction, and in default of payment to an imprisonment for a space of time not exceeding two months."

APPOINTED ENGINEER

Norman R. Wilson has been appointed chief engineer of the waterworks at Brantford, Ont., succeeding Mr. David L. Webster, who resigned on July 8. Mr. Wilson was formerly an inspector with the Canadian Fire Underwriters' Association.

CATALOGUES and BOOKLETS

The McAlear Mfg. Company, Catalogue No. 25

The McAlear Mfg. Company, 1901 Western Ave., Chicago, Ill., have issued Catalogue No. 25, covering high-grade and modern steam, water and air specialties for high and low pressure heating and power plants and devices for plumbing installation. The company's catalogue "25 Years of Know How," covering vacuum, vapor and air line heating specialties, is also ready for distribution. The catalogue covers a wide range of goods and copies and will be forwarded to readers of SANITARY ENGINEER upon request.

* * *

Pulverized Fuel

"Pulverized Fuel, Its Use and Possibilities," is the title of a 57-page booklet by William J. Dick, M.Sc., issued by the Commission of Conservation. Mr. Dick points out that the use of coal in pulverized form will make available large supplies which are now valueless, and discusses in considerable detail the methods for using these supplies. Readers of SANITARY ENGINEER who desire copies may obtain same by writing to the Conservation Commission at Ottawa.

London, Ont., Plumbers License Fee Set at $25

The Board of Health at London, Ont., has decided to make the license fee for plumbers $25 per annum. During the discussion over the matter one member declared that in his opinion the license suggested was too high and that it discriminated against the small man. In view, however, of the fact that in Stratford and other cities as much as $50 is asked, the Board decided that the amount was not out of reason.

The plumbing inspector has prepared a by-law regarding plumbing and drainage in the city, with special reference to inspecting drainage from the houses to the street, and having a standard drain adopted for future use. The by-law was approved and sent to the city engineer for his approval.

It was moved that the board of directors be requested to improve the lavatory conditions of the Western Fair. The accommodation, especially on the ladies' side, is entirely inadequate at present, according to the plumbing inspector.

RATS GNAWED LEAD PIPE

Harry Knechtel, of Kitchener, Ont., reports an unusual occurrence. While at a job in a residence on Victoria st., he found a lead hot water pipe which was almost cut into two parts. Upon examination he found that rats had been gnawing at the pipe and caused the damage.

Ask Service Charge For Gas Installation

The city council at Edmonton, Alberta, has decided to join with the Alberta Natural Gas Development Company, Limited, in an effort to secure higher rates. The following resolution was passed by the council: "That the report of the special committee on gas be adopted and that the city of Edmonton join in an application with or by the Northern Alberta Natural Gas Development Company, Limited, to the board of public utility commissioners, for the purpose of increasing the rates at which gas may be sold under its franchise by the company to the city and the inhabitants thereof so that the net price to be charged for natural gas supplied by the company to consumers in the city for domestic purposes will be thirty-five cents per thousand cubic feet, and the net price for all natural gas used in the city for power or manufacturing purposes will be 20 cents per thousand cubic feet, while the question of a ready to serve charge of 50 cents per month be submitted to the commission to satisfy themselves that such a charge is reasonable, usual and justified or a minimum charge should be established."

A new feature has been introduced into the application by the fact that the company are asking for a service charge.

This means that everywhere the gas is put in the consumer will have, in addition to paying 35 cents per 1,000 for gas consumed, to pay a meter rent of 50 cents per month, totalling $6 per year.

Indications Are That Extensive Building Activity Will Continue

Manufacturer States That Reports Received From Authoritative Sources Indicate That There Will be no Falling Off in Construction

NOTWITHSTANDING the approach of winter, extensive building operations are not only under way but are being planned throughout many towns and cities of Canada and the United States. This is the statement of a leading manufacturer of Toronto whose enamelled goods go into private homes and public buildings all over this continent. He keeps in closest touch with building operations, and his word is that, so far as residential buildings are concerned, records from the United States are equal to the best that have been in the past with no indication of there being a falling off of the business that comes to him through their construction. Speaking generally, he says that conditions here are much the same as in the United States, conditions arising from abnormally high prices and labor unrest.

Capacity Was Taxed

Six months ago orders being received by this firm were such that their capacity was being taxed to its utmost. There is no cessation of orders and, according to this manufacturer, they are touching but the very fringe of the large buildings under construction and which are to be equipped with their enamelled goods. With many other manufacturers, they are constantly faced with the problem of shortage of labor of the kind they want. Building operations are being held up because of the scarcity of workingmen; and behind this again, there is a scarcity of material due to the fact that factories cannot get workmen.

So far as the steel strike in the United States is concerned, this manufacturer informed SANITARY ENGINEER that, as yet, it was not affecting the trade. No large buildings are under construction at the present time which require great quantities of steel.

An interesting comparison of the increase in the cost of building and the advance in rents in the United States was given to SANITARY ENGINEER by this informant. It was pointed out that too little is known of these comparative figures and their bearing upon the high cost of living. An investigation was made of moderate and low-priced buildings in 150 of the principal American centres, and a report was compiled by the National Industrial Conference Board of the United States. It was shown that, whereas the cost of building had increased 83 per cent., the advance in rent was only 28 per cent. from June, 1915, to September, 1919. This comparison, so thought this manufacturer, applied equally to Canada where conditions were much the same.

APPOINTED SANITARY INSPECTOR

Sergt. W. H. Rau has been appointed Sanitary Inspector at Kitchener, Ont., to fill the position made vacant by the death of J. G. Buchhaupt. Sergt. Rau enlisted early in the war, and has been in charge of the sanitation department of the Petawawa camp during the war. His salary has been fixed at $1,000.

MAY BUILD INCINERATOR

The city council at Saskatoon has under consideration the question of building an incinerator and estimates will likely be secured shortly.

CONSTRUCTING SEWAGE SYSTEM

The town of Sutherland, Saskatchewan, now has a sewerage system under way, which, when completed, will afford modern conveniences to the largest part of the town, including an up-to-date school.

At present waterworks are in operation through the greater part of the town, and by contract with the Dominion Government, water is supplied to the Forestry farm through a main owned by the Government.

WILL AMEND BY-LAW

The recent tragedy at Ottawa, which cost seven lives by asphyxiation by illuminating gas has resulted in the jury recommending that the building permit by-law be amended to cover gas inspection. The jury found that Pierre Cardinal and his family, an account of whose death appeared in the last issue of SANITARY ENGINEER, were victims of a crack in a gas pipe which was caused by the gradual sinking of the house in which they resided. They were also of the opinion that the gas pipe was improperly placed for a house without foundation or cellar. The jurors made a careful personal inspection into the case.

Crawling under the house they found one of the joists that supports the floor resting on the pipe not far from the crack at the elbow. The pipe was forced down eight and one-half inches from its normal position. It was also discovered that the house had settled about ten inches since the pipe had been installed some 15 years ago.

Ontario Executive Visits Border City

Rousing Meeting Was Held at Windsor—On Way Down Visit Was Paid to Chatham and Fine Meeting Held—Practical Talks on Organization and Co-operation by the Officers

THE October meeting of the executive committee of the Ontario Society of Domestic, Sanitary and Heating Engineers, held in the rooms of the Builders' Exchange at Windsor, Ont., was one of unusual interest.

On the way to the Border City, President Thomas H. Minnes, of Brantford, Secretary Garrett Frankland, of Toronto, and K. B. Allison, of Toronto, were joined at London by E. H. Russell. The party stopped off at Chatham, and during the afternoon met the men in the trade. John W. Draper presided, and the gathering turned out to be the inaugural gathering of the Chatham branch of the society. Those in attendance were C. R. Bowers, M. J. Baxter, Ed. Wanless, G. D. Watts, and R. McG. Coyle. The applications of Messrs. Wanless, Baxter, Bowers and Draper for membership in the Ontario society were received and accepted.

Gave Interesting Talks

During the meeting interesting talks on organization work and on matters of interest to the trade were given by President Minnes, E. H. Russell, Garrett Frankland, and K. B. Allison.

Vice-President George B. Grinyer, of Guelph, joined the party at Chatham and proceeded with them to Windsor for a big meeting in the evening. It was decided before leaving Chatham to hold another meeting in the near future, to which others in the trade will be invited.

The meeting at Windsor was presided over by Alex. White, of the Windsor Hardware Co., and those in attendance were Secretary Charles E. Paddon, G. Edwards, Alfred L'Heureux, C. Jessop, G. Smith, R. Hicks, W. Baker, W. Hutchinson, A. L. Pickering, all of Windsor, J. C. Service, N. Fielding and A. Trott, of Walkerville.

Applications Accepted

The applications of Alex. White, R. Paddon & Co., Edwards Plumbing Co., Roy Hicks, A. L'Heureux, Geo. C. Smith, and A. L. Pickering, of Windsor, and of N. Fielding and J. C. Service, of Welkerville, for membership in the Ontario Society, were received and accepted.

It is expected that the remainder of those in the trade will affiliate with the Ontario Society, and in that way secure the local privileges under the Ontario charter.

President Minnes gave a splendid address on the work that is being done in connection with organization in Ontario, and made a broad appeal for the support of every man in the plumbing and heating business. He pointed out that the only way in which the best results will be obtained will be by hearty co-operation.

All Will Benefit

If every man in every town works together in solving local problems there will be little difficulty in solving them. This has been the general experience. President Minnes showed that in addition to helping one another locally, those in the trade can, by working in close co-operation with one another, solve Provincial and Dominion problems, all of which have a direct bearing upon local conditions and problems.

E. H. Russell, of London, Ont., also spoke on organization work. He emphasized the importance of getting together and working together for the common good. The first object of the trade, he said, is to serve the people, and benefits will only accrue through the association in proportion to the amount of good accomplished for the greatest number. He urged every man in the trade to lend all the assistance he can toward the great work of co-operation and organization.

Made Strong Appeal

Vice-President Geo. B. Grinyer, of Guelph, made a strong appeal for co-operation among every member of the trade. The good results of working together, he said, were becoming apparent in many places in Ontario to-day, and while much has been accomplished there is a great deal to be done yet. No work was more important not only for the men in the trade but for the great mass of people whose health and comfort are closely dependent upon the work done by the sanitary and heating engineers. He urged the men in Windsor and district to get together and work together, to meet regularly and talk things over, to get to know one another, and in a short time they would see the results that follow co-operation.

Secretary Garrett Frankland gave a talk on the vital importance of overhead in the successful conduct of business.

K. B. Allison, who is chairman of the Ontario Committee on Education gave a practical address in which he pointed out the importance of proper bookkeeping and accounting. These, he said are essential to any business if a man is to know where he stands.

Ontario Executive Plans Meetings at Oakville and in the Galt-Kitchener District

THE members of the executive of the Ontario Society of Domestic Sanitary and Heating Engineers are planning to hold their November meeting so as to meet the men in the trade in Galt, Preston, Kitchener and Waterloo. Just where the meeting will be held has not yet been decided, but it will be held about the end of the month and a series of practical talks on matters of interest will be given.

Arrangements are also being made for a meeting at Oakville at which all the men in the trade along the Toronto and Hamilton highway will be invited to attend. This meeting will be held during the last week in November, the date not yet having been chosen.

The executive committee is planning an aggressive campaign which will reach throughout Ontario. It is felt that there is a big work to do and that the encouragement that is coming from all quarters warrants the efforts that are being put forth to get big results.

MONTREAL STRIKE LIKELY NEAR SETTLEMENT

There is every indication that a settlement may be effected in the strike at Montreal. The Master Plumbers, at a special meeting, decided that they would treat with the men who are out on strike provided they would return to work and discuss wages and working conditions for the ensuing year, and appoint John W. Bruce, general organizer of the United Association of Plumbers and Steamfitters as their representative.

There are about 800 union plumbers in the city, and of this total it is estimated that 200 are on maintenance work, or work which brings them under the jurisdiction of unions other than that of the official plumbers' body. It is estimated that about 550 men are on strike. Some have left the city to go on with their work elsewhere.

Union officials claim that there has been a great increase in the number of members in the union since the strike began, and that the trade in Montreal is now 97 per cent. organized.

PLAN TO USE ELECTRICITY

A delegation from the Water Commission at St. Thomas, Ont., visited Stratford last week inspecting the local Waterworks plant. St. Thomas board intend changing their system from steam to electricity.

Prices of Sheets May Not be Lower for Two Years

This Opinion is Held by Men in the Trade in the United States, Says A. T. Enlow, After Attending Meeting in New York

A. T. ENLOW, president of the Dominion Sheet Metal Company, Hamilton, Ont., who has just returned after attending the annual meeting of the American Iron and Steel Institute in New York, stated to SANITARY ENGINEER that the general belief among the men in the trade is that prices of sheets will not be lower for at least two years.

"We have lost through this strike," said Mr. Enlow, in referring to the steel strike in the United States., "at least 2,000 tons of material which would have been shipped had it not been for the strike. Notwithstanding all, our idea has been to keep prices down, except to that point where cost overtakes the selling price. We are opposed to higher prices for sheets. Rather help the consumer than the Government, because, in the end, the consumer is the Government and we avoid the loss of handling."

Increasing Capacity

"We are preparing to add to our equipment sufficiently to enable us to produce 50 per cent. more than we have in the past. In other words, our capacity will be about 20,000 tons of galvanized sheets per year from the first of January. We are also building a new warehouse, which, when completed, will enable us to carry in stock not less than 2,000 tons for immediate shipment," said Mr. Enlow.

While temporarily inconvenienced by the steel strike in the United States to the extent that their plant is only running at about one-half its normal capacity, the Dominion Sheet Metal Company is planning for bigger business for the future.

He says that this country is not producing enough galvanized sheets for the trade, the result being that large quantities have to be imported. The present situation is aggravated by the strike in the United States; supplies of raw material are cut off, and they are picking over their stock for black sheets and even getting some from the jobbers.

At Old Prices

"We have, naturally, and the jobbers naturally have, a lot off stuff contracted for at old prices, but most of this is sold so that on any old business, no matter how long delayed, the price will be the old price. This will have a tendency to keep the prices down; but to anyone who must have quick delivery and where it is possible to accommodate them, the higher prices must prevail," said Mr. Enlow.

It is not the intention of the Dominion Sheet Metal Company, however, to launch higher prices for their manufactured article. Mr. Enlow shies clear of the word "profiteering" at a time when it is in everybody's mouth. While conditions may more or less warrant an increase in price, the aim of this company is to keep the prices normal and reasonable.

"Our tendency is to hold prices down to a reasonable basis," said Mr. Enlow, "for if sheet metal is to continue to hold its place on the market, it must be able to compete with similar articles." Though Mr. Enlow does not anticipate any immediate increase in prices, he does not see any reduction for some time, at all events.

Many New Devices At Electrical Show

Visitors to the electrical show, which closed last week in New York, were impressed by the multitude of new devices all aimed to make life easier, or make work easier. The efficiency and wide range of application of electricity as a servant was never more fully demonstrated. The show served to give an idea of the size and scope which the electrical industry has assumed. It is growing larger every day and any number of sanitary and heating engineers who have been handling various electrical lines, fixtures, irons, washers, vacuum cleaners, etc., may be interested in some of the devices shown. There were machines for milking cows, making ice, hatching chickens, stimulating the growth of plants, reducing weight, growing hair, removing hair, pulling teeth, washing clothes, counting money, operating typewriters, and almost everything one could imagine.

Among the brand new electrical innovations shown were a machine which both washes and dries clothes in the same tub, an attachment which provides steaming hot water from the cold water faucet, and a carpet washer which cleans, restores color, and kills germs at one operation.

Among the feature exhibits were the electrical dairy with six thoroughbred Guernseys and Holsteins which were milked at half-hourly intervals, the milk passing from the cow's udder and through the cooling process to the bottle without once coming in contact with the air; the electrical hospital and therapeutic display, the modern electrical apartment, the electrical bakery, the motion picture theatre, and others, all in actual operation.

START NOW TO FIGHT AGAINST A RECURRENCE OF THE INFLUENZA EPIDEMIC

Build Up Your Strength

THE possibility of a recurrence of the influenza epidemic this Fall or Winter has caused health commissioners in various cities to issue instructions to aid in its prevention.

Here they are:

1. Obey all regulations of the city health authorities.

2. Avoid crowds.

3. Stay away from anyone having a cough or a cold.

4. Drink plenty of fresh water.

5. Keep the home well ventilated and be sure there is plenty of fresh air day and night.

6. Sleep with the windows open.

7. Avoid fatigue and get plenty of rest; in particular, avoid fatigue of the stomach and excessive eating of unsuitable food. Sleep is one of the most important things, and the thing that is most neglected.

8. Be as much as possible in the open air and walk to your work if practicable.

9. Eat three uniform meals a day, and avoid a breakfast of mere coffee, and only a piece of cake or something of the kind for lunch. Special precautions should be taken against gorging at dinner time, when the stomach is least able to cope with the largest meal of the day, and which practice is bound to lower the resistance of the system.

10. Keep warm and keep dry; wrapping up the neck or exposing the neck and arms unduly are undesirable in the changing weather of the fall.

11. Bathe frequently. The skin is part of the breathing system of the body and must be aired.

12. Exercise regularly, both in the open and indoors, if possible.

13. Avoid the common drinking cup or glass.

14. If you feel sick and have a cold coming on, go to bed. Call the doctor. Stay in bed until the doctor says you can get up. Don't receive callers or visitors until the doctor says that danger of infection is passed.

A NEW HEATING SYSTEM

(Continued from page 23)

(18) of the electric motor so that the pressure of the cooled compressed air remaining may be utilized to relieve to a certain extent the work of the motor. The safety valve is of the adjustable type so that it may be adjusted to relieve at various pressures. The adjustment may be regulated to increase or decrease the temperature of the circulating water through the heating system, for as the pressure increases the temperature rises.

It is stated that a system such as described has in experimental tests shown extremely satisfactory results, and when it is considered that the compression of air to 100 lbs. produces a temperature of approximately 450° Fahrenheit with an intake temperature of 60° Fahrenheit, the heating of water can be accomplished to suit the requirements of very extreme weather, besides providing cold air for refrigerating or cooling purposes, and the inventor further states that the application of electric energy to the production of heat in the manner described is entirely novel, and it is further stated that many variations in the actual apparatus may be made without departing from the principles of the invention.

Fall Program of "Ender" Clubs One of the Best That Has Ever Been Arranged

Meetings Commence on Monday Evening—Practical Talks on Practical Subjects by Men Who Know — Informal Discussions to Take Place After

Not in a long time have the "Ender" clubs of Toronto had such a fine program of interesting and practical topics arranged for discussion as is ready for the inaugural meeting of the season on Monday evening.

During the spring months keen interest was taken in the meetings and many of the men in the trade learned much that was of real help to the members in making for better business. From present indications the fall program will completely eclipse that which was put on earlier in the year. The attendance at many of the spring meetings was such as to fill the meeting rooms to capacity. This interest is most encouraging and speaks well for the future.

The following program, which covers the next two months, speaks for itself and contains topics which are of keen interest to everyone in the business. They will be dealt with by men who know their subjects, and not only this, but there will be discussions afterwards in which much helpful information may be gained from the questions asked. Informal discussions following practical talks proved most interesting and helpful during former meetings and this practice will be carried out in the fall series of meetings. The program is as follows:—

Club.	Topic.	Speaker.
Nov. 3—West.	Water Test	B. Kirk
Nov. 4—East.	Sewerage	W. Worthington
Nov. 6—North.	Water Meters	W. Randall
Nov. 10—West.	6½-Piece Job	W. H. Daw
Nov. 11—East.	Smoke Testing	H. Fitzsimmons
Nov. 13—North.	House Heating by Gas	M. Dodds
Nov. 19—General.	Nomination Night Credits	P. W. Michael
Nov. 24—West.	Allpriser	K. B. Allison
Nov. 25—East.	Allpriser	K. B. Allison
Nov. 27—North.	Collective Bargaining.	J. W. Bruce
Nov. 28—Oakville.	Ontario Society.	
Dec. 1—West.	Cast Iron vs. Tile.	L. Anthes
Dec. 2—East.	Technical Education	J. E. Fullerton
Dec. 4—North.	Septic Tanks	E. Newsome
Dec. 8—West.	Accounting	D. McLulich
Dec. 9—East.	Overhead	J. Erskine
Dec. 11—North.	Allpriser	K. B. Allison
Dec. 17—General.	Election Night; Municipal Affairs.	Cont. McBride
Dec. 29—Special.	Santa Claus Night Better Plumbing. Moving Pictures Kazoo Band	Fred Armstrong

Canadian Supplies of Soft Coal Sufficient for Immediate Needs

TIMELY warning to all users of bituminous coal to secure their winter supplies as soon as possible is given by S. B. Brown, assistant manager of the Transportation Department of the Canadian Manufacturers' Association. Information, or the lack of it, reaching this department of the C.M.A. leads Mr. Brown to the conclusion that manufacturers throughout Ontario are either well supplied with the necessary coal for the winter, or they have such supply on the way to their bins. No requests are reaching him for assistance in getting coal with which to keep the wheels of industry revolving during the winter months.

Two Reasons For This

The reason for this is, according to Mr. Brown, two-fold. Up until November 11, Armistice Day, of last year munition plants were running at full blast. Manufacturers had secured sufficient supplies to last them through the winter and well on into the summer. With the signing of the armistice, munition contracts ceased and plants were closed down, with the result that large quantities of coal were still on hand. Added to this is the second cause—frequent strikes. The mild winter was also a contributory factor in the conservation of coal.

Manufacturers Warned

A warning was issued to manufacturers by the C.M.A. recently to look after their coal supplies; and Mr. Brown believes that this warning was heeded because no representations have been made to the C.M.A. of any shortage that might paralyze industry. To confirm this view, the Gas Company has issued a statement that it is not worrying over the situation so far as this winter is concerned.

Mr. Brown states, however, that it is difficult because of lack of information in their offices to say just what the situation is: and he advises that users of coal should waste no time in assuring themselves of a winter supply. The strike in the United States, despite the action taken by President Wilson and Secretary Baker to insure the necessary output, may also adversely affect the situation in Canada, particularly in the Eastern part of the Dominion, which is almost entirely dependent upon United States coal fields for its supply.

VENTILATING THE MODERN SCHOOL

(Continued from page 35)

terial than masonry for the smooth ducts required in a gravity system of ventilation.

In every case the air leaves the class room by way of the wardrobes, so that there is a continuous flow of warm, dry air flowing through, and keeping the cloak rooms as sanitary as any part of the building. This should be noted because far too often the ventilation of cloak rooms does not receive the attention that it should.

The ventilation of the toilet rooms in the basement and those on the first floor is effected by direct foul air extraction shafts that are not connected in any way with the main ventilating system.

At the rear of the toilet fixtures on the first floor, there is a service passage that also serves for a ventilating shaft. This shaft connects with a separate flue in the main chimney.

Located in the Centre

Although the gymnasium is situated right in the centre of the main part of the basement there are no galvanized iron ducts showing at its ceiling, neither is there any galvanized iron showing in the cloak rooms above the basement. The unsightly appearance of galvanized iron in such rooms cannot easily be avoided unless the design for the ventilating system is carried along with the general design of the building just as in this example.

Direct radiation made up of wall sections is used in all class rooms. Wall sections were chosen as a pattern that takes up less room than the ordinary standard radiator. The sections are 2 ft. wide by 1 ft. long; they stretch clear across the window bays and thus distribute their heating surfaces much better than do other types of radiators.

Standard cast iron radiators are used in all small rooms, in the assembly hall, and in the corridors.

System of Space

The system of piping for the indirect radiators is that of the two pipes. Each return from the sections enclosed in the fresh air chambers has a swing check on its return. The water level of the boilers is at least 4 ft. lower than the lowest point of the indirect radiators.

The direct radiators are fed from a one-pipe steam line, with dry returns.

Automatic air vents are of the expansion post type and are connected by way of a small air line to a syphon in the boiler room. The syphon is attached to the domestic water supply, with an exhaust opening visible to the boiler attendant.

The boilers are of the self-feeding water-tube type and are probably the first two boilers of that kind used in a public building in Canada.

There is approximately 6,000 sq. ft. of radiating surface in this building, including both direct and indirect radiators.

Heating and Ventilating

Ventilating the Modern School

Fourteenth Article of Series Written Especially for "Sanitary Engineer" by N. A. Kearns—First Article of Series Appeared in April 1 Issue

THE building shown in the accompanying photograph is the Collegiate Institute at Yorkton, Saskatchewan.

This building was erected about ten years ago, and for that reason is not so modern in many of its details as other buildings we might take as an example of advanced school architecture, still it receives many favorable expressions of opinion from educational authorities, and as the ventilating system in this building illustrates many of the working principles of a gravity plant, the presentation of this article should be of value to the man who wishes to study what is even, aften ten years of use, considered as a modern gravity system of ventilation.

The building is much larger than it appears to be in the photograph, as there is an extension at the rear that does not show in the picture.

Details of Building

The size of the building can be appreciated when one understands that there is contained within the walls of the building the following rooms:

Gymnasium, 40 ft. x 50 ft. x 16 ft.; manual training room, 24 ft. x 32 ft.; domestic science room, 24 ft. x 32 ft.; six class rooms, each 24 ft. x 32 ft.; chemical laboratory, 24 ft. x 32 ft.; physical laboratory, 24 ft. x 32 ft.; biological laboratory, 27 ft. x 27 ft.; balance room; dark room; preparation room; male teachers' room; lady teachers' room; girls' lunch room, 25 ft. x 32 ft.; boys' lunch room, 25 ft. x 32 ft.; assembly hall, 40 ft. x 60 x 15 ft. (with large stage and two dressing rooms); boys' locker room and showers; girls' locker room and showers; two toilet rooms in basement; two toilet rooms on first floor; fireproof machine booth in assembly hall; library, 16 ft. x 20 ft.; principal's private office, 15 ft. x 9 ft.; principal's public office, 15 ft. x 9 ft.

The Other Rooms

In addition to the rooms listed, there are cloak rooms adjacent to every classroom and laboratory in the building, as at the time of its erection it was the custom to provide each class room with a cloak room instead of having common locker rooms as found to-day in high schools. The store rooms are all large and well lighted.

It is not often that a school as large as this is equipped with a gravity system of ventilation, and at the time of its design many of the details, as specified, received vigorous criticism from men who have since adopted the standards set in this building.

The Compound Type

One of the terms of the specification covering the temperature regulating system was that the thermostats must be of the compound type. By this it was meant that the thermostat controlling the valves of the direct radiators in a room must be also set to control the temperature of the incoming fresh air. In this connection it may be remembered by the High School Board that a salesman for a temperature-regulating device said that such a requirement was impossible of fulfilment. He contended that there was not such a thing on the market. That salesman was honest in his opinion, but he was not keeping abreast of the times.

There were conditions obtaining at the time of the installation that made the design of a gravity system preferable to that of mechanical ventilation. Not one of the least of these was that electric power could not be obtained for the driving of fans.

In a very cold climate, where there is such a great temperature range, a gravity system of ventilation may be designed with much smaller flues than those required in a warmer climate.

Favored Gas Engine

One of the advocates of the plenum system of ventilation recommended the installation of a gas engine in this building, and to prove his point of the superiority of the plenum system attempted to illustrate it where he had forgotten to complete his work of coupling up the fan with the motor.

After carefully weighing all the claims for various systems, the engineer in charge of this work could not feel safe in specifying anything but a gravity system of ventilation after seeing so many fans standing idle in Western schools. Since that time great strides have been made in the art of mechanical ventilating systems, and it is altogether likely that to-day a plenum system of ventilation might be specified for such a building instead of that now described.

Experience Difficulty

Ordinarily a good deal of difficulty is experienced in getting janitors willing to adjust the dampers in the ducts of gravity ventilating systems as the conditions of weather change. This in a measure was obviated in this system by having most of the checking dampers arranged so that they may be controlled from the boiler room by opening and closing valves in the air lines leading to the spring motor of each damper.

Standing alone in the centre of a large lot, no air washing system is required in this building. Had there been a necessity for an air washer, a fan system would have been specified.

The design for the ventilating system was carried along with the structural design of the building. The floor levels, the joist centering, the space for the fresh and foul air ducts, all were arranged so that such a system could be properly installed.

Fresh Air Chambers

There are four separate fresh air

chambers where the cold fresh air is heated to the temperatures required. The fresh air chambers are arranged something in the manner of that described in the fourth article of this series (June 1, SANITARY ENGINEER). The principal difference in the fresh air chambers installed and those illustrated is in the arrangement of the air tempering dampers.

Each fresh air chamber is connected to fresh air ducts running straight up to class rooms. The lower side of the fresh air chamber connects to a cold air opening in the exterior wall. All cold air openings are protected with weather proof louvers and wire screens. Just inside of each opening there is placed a damper that may be adjusted to suit different conditions of weather.

Without going into the method used in setting a standard for the indirect heating surface set in these stocks, we may say that for each class room there was specified about 192 sq. ft. of extended surface radiation of the cast iron type.

Capacity of Flues

The fresh air flues leading to the class rooms have an area of a little more than 6 sq. ft. each.

The fresh air faces in each class room are made of galvanized iron. They are of that type where the top and bottom frame are formed as segments of a circle having vanes arranged so as to radiate from a common centre and thus split up the air into streams of varying directions.

The foul air escapes from each room by way of an opening set in the flue at the floor line. These openings have no faces. The flooring runs right into the flue, and the base board returns around the angles. The flues are all large enough to admit of cleaning if at any time such a thing is required.

Opening at Ceiling

It is not only at the floor line of the foul air flues that there is an opening for the admission of vitiated air; there is another opening, and it is at the ceiling line. The opening at the ceiling line is provided to allow foul air to escape from the class room during the summer months, when the windows are used as an aid to the natural system of cross ventilation. This opening is closed in the winter.

The foul air flues are carried up to the attic space where they are connected to two large vent shafts. The roof of one of the shafts may be noticed in the photo, just where it shows at the apex of the south-west hip. The building is facing south.

The vent shafts are 8 ft. square and may be entered from the main stairways. Each ventilating shaft has a graduating damper set in the air escape opening. The function of such a damper is to either close the opening entirely or to vary its size to meet different conditions of weather.

Of Galvanized Iron

All air flues are made of galvanized iron, it being considered a better ma-

Continued on page 32

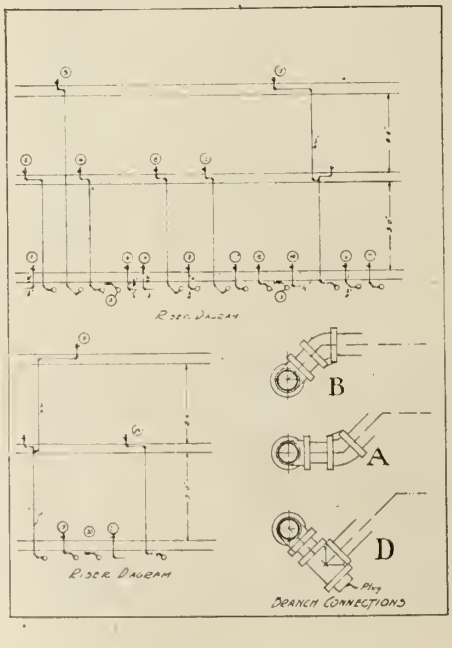
Taking Care of Forty Below Zero

Fifteenth Article of Series Prepared for Readers of "Sanitary Engineer" by N. A. Kearns

Editor's Note—This article is the fifteenth of a series, prepared especially for the readers of SANITARY ENGINEER, covering heating and engineering practice reduced to its simples terms. Readers will find this article on "Taking Care of Forty Below Zero" a most illuminative one. The first article of the series appeared in the April 1 issue. Descriptions of installations made in different classes of buildings will be given, together with the method used in making the design for these installations. It is not our purpose to give complicated formulas, but rather to present the simple rules that have been based on these formulas, in such a way that the reader will be enabled to design a heating and ventilating system without having to refer to the data given in engineers' hand-books. The author of these articles, Mr. N. A. Kearns, has designed heating and ventilating equipment for all classes of buildings in practically every province of the Dominion. Some of the buildings were such that the heating and ventilating equipment had to be installed under the most adverse conditions, whereas in other buildings the design for the heating and ventilating equipment was incorporated in the constructional drawings. The sixteenth article of the series will appear in the next issue.

THE drawings accompanying this article are the plans of a heating system to be installed in a residence in Central Saskatchewan, where the thermometer goes down to forty degrees below zero, and stays there for weeks at a time.

Before taking up the subject of the piping system or any other details we shall explain the method used in making an estimate of the radiating surfaces required in a residence situated in such a cold climate. The reader who has studied the functions of the B.t.u. will have no difficulty in setting standards for any temperature range. In the articles that have appeared in this series our endeavor has ever been to make clear the fact that the B.t.u. may be used as an aid in setting a definite standard for a rapid and accurate system of estimating radiation.



Many are Bothered

Many engineers have a conscience that bothers them greatly in estimating radiation when they do not go through all of the motions of dividing and multiplying, and then dividing their figures again. They waste a great deal of time because they cover the same ground an unnecessary number of times. They use the B.t.u. system with such fearful care that an understanding of its real purpose escapes their attention. So they go ahead estimating radiation by the letter of the rule instead of its spirit.

The radiating surfaces necessary to keep the rooms of this building at a temperature of 70 degrees above zero when the outdoor thermometer registers 40 degrees below, could be readily arrived at by using the figures given in former articles for 10 degrees below zero weather, and then adding 37 per cent. to the amount of radiating surfaces estimated.

Are Much Warmer

As a rule the houses built in Western Canada are of a much warmer system of construction than those in the East, so this must usually be taken into consideration when figuring the radiating surfaces. Many of the Western houses have storm windows, and this also must be allowed for.

However, this house is to be considered as having the same kind of outer walls as may be found in the East. No storm windows will be used.

Radiating Surface

The heat loss system for estimating the amount of radiating surface required is expressed in the following rule:

$$\frac{\frac{C}{55}+\frac{W}{4}+\frac{G}{1}\times T.R.}{E}$$

C indicates cubic contents.
W indicates exposed wall.
G indicates window and door surface.
E = indicates efficiency of the radiating surface.
T. R. indicates temperature range.

Are to be Divided

This means that the cubic contents are to be divided by 55 for one change of air per hour. If more than one change of air is required the answer found by the division must be multiplied by a number corresponding to the number of changes required. The temperature range from 70 degrees above to 40 degrees below is 110 degrees.

In this rule all heat loss factors are transformed into an equivalent glass surface by the dividing constants indicated before the factors of temperature ranges and of radiating surface enters the calculations.

To Simplify Rule

To simplify this rule we shall estimate by one division the radiation required for each factor. As an example we shall take the cubic contents first.

It will be noted that in following the above rule that there is first a division, then a multiplication, and then another division. Instead of dividing by 55 and then multiplying by 110 and then dividing by 155, we shall make one division that must give us a similar result. The dividing factor equal to the three calculations is approximately 77.5.

Following the same system for the wall and glass surfaces gives us the dividing factors of 5.7 for the wall and 1.4 for the windows and doors. But we shall go a step beyond this. Calculations by divisions entail more figuring than those made by multiplication so we change the dividing factors into terms of percentages, thus:

77.5 = .0128
5.7 = .175
1.4 = .71

The Next Step

Our next step is to make a list of the rooms requiring heat, together with their cubes, wall exposures and window surfaces.

Basement

Laundry: 1,125 cubic ft., 50 sq. ft. of wall, 33 sq. ft. of windows.
Playroom: 3,000 cubic ft., 52 sq. ft. of wall, 18 qs. ft. of windows.

Ground Floor

Kitchen: 1,180 cubic ft., 150 sq. ft. wall, 30 sq. ft. of window.
Pantry: 198 cubic ft., 25 sq. ft. wall, 15 sq. ft. of window.
Rear Entry: 168 cubic ft., 27 sq. ft. of wall, 21 sq. ft. of window.
Coat Room: 160 cubic ft., 25 sq. ft. of wall, 7 sq. ft. of window.
Hall, 1,008 cubic ft.
Toilet: 108 cubic ft., 20 sq. ft. of wall, 7 sq. ft. of window.
Vest.: 144 cubic ft., 15 sq. ft. of wall, 21 sq. ft. of window.
Dining Room: 1,962 cubic ft., 243 sq. ft. of wall, 45 sq. ft. of window.
Living Room: 2,871 cubic ft., 179 sq. ft. of wall, 55 sq. ft. of window.
Sun Room. 182 sq. ft. of window.

First Floor

Hall: 1,389 cubic ft., 55 sq. ft. of wall, 20 sq. ft. of window.
Bath: 357 cubic ft., 45 sq. ft. of wall, 14 sq. ft. of window.
Bedroom No. 1: 892 cubic ft., 169 sq. ft. of wall, 15 sq. ft. of window.
Bedroom No. 2: 1,717 cubic ft., 242 sq. ft., 30 sq. ft. of window.
Closet: 191 cubic ft., 32 sq. ft. of wall, 6 sq. ft. of window.
Bedroom No. 2: 1,717 cubic ft., 242 sq. ft. of wall, 30 sq. ft. of window.
Bedroom No. 4: 1,215 cubic ft., 151 sq. ft. of wall, 43 sq. ft. of window.

Second Floor

Attic: 7,421 cubic ft., 466 sq. ft. of wall, 88 sq. ft. of window.

Are Not Given

It should be noted that the cubic contents of the sunroom are not given, nor the wall surface. In a room having so much glass it is not necessary to consider the wall surface and the cubic contents.

Several of the rooms that will not have heating surfaces are included in the list. It is our practice to put enough radiating surface in the surrounding rooms to make up for the heat lost by reason of the proximity of any unheated room.

The heating surfaces required are found to be:

Laundry, 44 sq. ft.; playroom, 60 sq. ft.; kitchen, 47 sq. ft.; pantry, 17.3 sq. ft.; entry, 23 sq. ft.; coat room, 13 sq. ft.; hall, 26 sq. ft. vestibule, 21 sq. ft.; dining-room, 147 sq. ft.; living-room, 138 sq. ft.; sunroom, 129 sq. ft.; bedroom No. 1, 59.5 sq. ft.; bedroom No. 2, 94 sq. ft.; closet, 12 sq. ft.; hall, 59.2 sq. ft.; bath, 27 sq. ft.; bedroom No. 3, 71 sq. ft.; bedroom No. 4, 71 sq. ft.; attic, 238 sq. ft.

To be Changed Twice

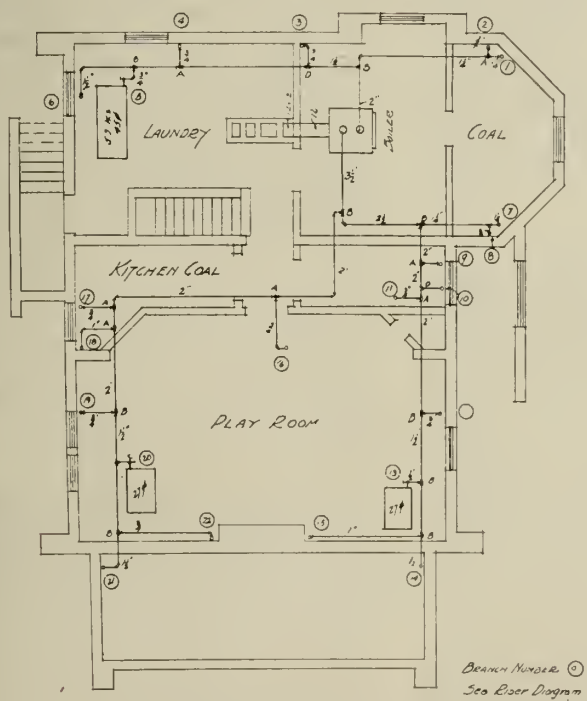
The air is to be changed twice per hour in every room on the ground floor, except the kitchen, where it is to be changed but once. An air change of three times per hour is allowed for the vestibule.

Bedrooms have one change of air per hour.

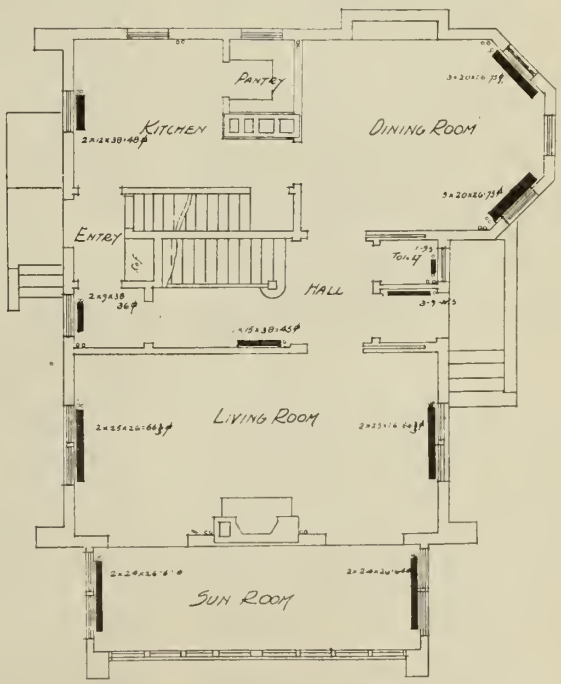
Reference to the plan will show how the radiating surfaces are arranged so as to provide approximately the surfaces estimated. The rooms with north or windward exposure have from 10 per cent. to 15 per cent. more radiating surface indicated than our estimate demands.

Fairly Extensive

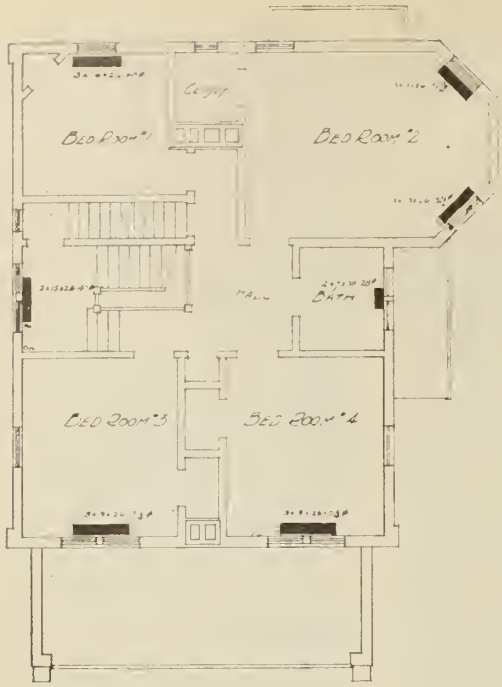
This is a fairly extensive hot water heating plant. There are twenty-four radiators to be installed, most of them



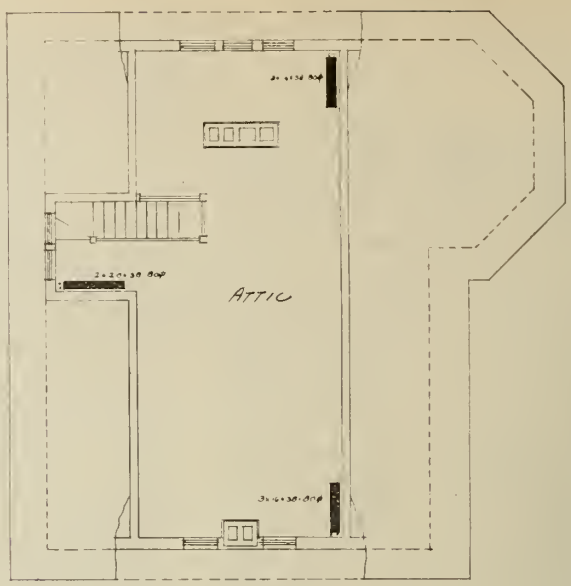
PLAN OF BASEMENT.
NOTE - Flow mains only are shown. The returns are of the same size, and run parallel with the feeds



GROUND FLOOR



FIRST FLOOR



SECOND FLOOR

of a large size. The boiler is situated in one end of the building, and for this reason as well as on account of the size of the plant, we should design the piping system on the principle where one main feeds hot water to the radiators on all floors, and a corresponding main is used for the return. To do this in the most economical way, it becomes necessary to reduce the tappings of the radiators to the following sizes:

	Ground Floor	First Floor	Second Floor
½ in.....	30 sq. ft.	40 sq. ft.	50 sq. ft.
¾ in.....	160 sq. ft.	100 sq. ft.	125 sq. ft.
1 in.....	100 sq. ft.	125 sq. ft.	150 sq. ft.
1¼ in.....	over 100	over 125	over 150

Are Less in Few Cases

In a few cases the tappings of the radiators on this plan are less than given in the table. An examination of the conditions under which such radiators are installed will show why the tappings have been reduced. For example, take the two radiators in the living room. According to the schedule those radiators should have 1 inch tappings, but because their branches are taken out of the top of the main the tappings are reduced one size.

One of the features of this style of piping is the unusual way of taking branches from the mains. On the basement plan each branch connection is marked with a letter corresponding to a letter indicating a detail on the drawing showing the branch connections. It is the proper use of these fittings that makes possible the installation of large hot water heating plants under the gravity principle.

Branches Taken Out

The radiators that are close to the boiler have their branches taken out of the side or bottom of the main. Those some distance from the boiler are taken out of the top of the main.

The fitting marked "A" is the one most frequently used. It is used for all branches when no reduction in main takes place or when a branch is not taken out of the bottom of the main.

The fitting marked "B" is used when a long lateral branches from the main, or when reductions occur. It should only be used for ground floor radiators, ecept in such cases where a runout to an upper floor radiator is very long. The reason for using this fitting when mains are reduced is to avoid the formation of air pockets. The mains could be reduced by means of eccentric reducers turned with the reduced end on top; in fact, when a pipe must be run some distance before reaching a ground floor radiator, it would be well to use the eccentric reducer in preference to running a full-sized main to an unreasonable length.

Used to Branch Out

The "D" connection is used to branch out to the risers close to the boiler. Nearly all of the risers in the first half of the main should have "D" connections. Each D connection should have a plugged opening in its lower end for the purpose of drainage.

One other connection to which we should draw attention is that where a riser is continued up past a radiator on the first floor. It will be noted that the riser does not continue straight up, but that it branches out below the first radiator.

To Lay Out Pipe Sizes

In laying out the pipe sizes we proportion the mains to the tappings of the radiators. In this way we are enabled to use rather small pipe in proportion to the amount of radiating surface. In all cases the mains should be equal to, or slightly in excess of the combined area of the tappings fed.

Mains under 2 inches in diameter should not be reduced more than one size in their entire length.

The last radiator fed should be on the ceiling of the basement or on the ground floor, and it must be fed out of the top of the main. The mains all grade up from the boiler to the radiators.

Instal Good Generator

In a small pipe system of this description it is advisable to instal some good generator as an expansion sealing device. The generator may be placed just below the tank if it is of the air-seal or counterweight pattern. The best place for the generator is in the basement. There are some types of generators that can only be properly placed above the circulation. In such a case the expansion pipe can be connected directly to the return of the highest radiator.

The boiler specified, for the plant here illustrated, has a gross rating of 1,850 sq. ft. of direct radiation. Because it is of the square type, wood may be burned in it during the fall and spring months.

RECOMMENDS MORE BAFFLES

As a special meeting of the Board of Health at St. Thomas, Ont., a letter was received from F. A. Dallyn, Provincial Sanitary Engineer, regarding the septic tank at the foot of Walnut Street, which has been causing some trouble of late. He stated that one of the chief troubles with the tank was that there was too much of a fall before the water entered the tank, and believed the installation of more baffles would overcome this difficulty.

Market Conditions and Tendencies

STATEMENTS REGARDING SUPPLIES AND TREND OF PRICES

THE MARKETS AT A GLANCE

SCARCITY of material is greatly interfering with trade just now. No trouble is experienced in securing business; the problem seems to be how to handle it and give any kind of service. Stove manufacturers are behind with orders and this has a direct effect on the stove and heating business. Air-tight heaters are selling well. Wood furnace business is reviving. One maker stated to SANITARY ENGINEER that his firm were over one hundred wood furnaces behind in their orders. A sudden cold snap, it is thought, will generally cause a stove famine.

Enamelware continues to be scarce, notwithstanding the assertion of makers that they would be back on their old footing in short order. The situation is made more difficult by a number of plumbers who have no follow-up system and book orders with no delivery stated, then call for immediate delivery. Others order six to eight weeks ahead for immediate shipment to the job with the result that they are not getting any benefit while other plumbers are handicapped.

Soil pipe continues scarce with no relief expected till labor conditions are straightened out and the demand automatically relieves itself with the cold weather.

Galvanized sheets show a stronger figure owing to strikes, transportation and labor conditions generally, and especially the fact that stocks are almost exhausted with little chance of any immediate relief. This also applies to black sheets. Solder is very firm on account of the strong tendency lead has taken. Antimony also shows a stronger figure. Wrought nipples advance as predicted. Old materials are quiet. Stilson wrenches advance.

It would be very hard to predict just how the impending coal strike will affect ingot metals. Some think it will not materially effect Canada as some manufacturers have mountains of some classes of ingots, it is reported.

TORONTO, October 31.—Galvanized sheets show a stronger figure owing to the condition and almost exhausted stocks, with little chance of any immediate relief. Black sheets are in the same predicament and also show a higher figure. Copper shows a decline, while antimony is stronger. Lead prices also show firm. Enamelware continues to be scarce and is inconveniencing manufacturer and consumer, not to mention what the troubles of the merchant are. Soil pipe fittings are higher, and soil pipe continues to be scarce. Solder is also firm on account of the lead situation.

Caulking Lead Advances 1½c Per Pound

CAULKING LEAD is recorded with an advance of approximately 1½ cents per pound. It would be hard to state any special factor unless it is the fact that metals along this line have been getting firmer. This new price on caulking lead has caused no surprise as this class of metal is very sensitive on the open markets, and is easily affected by fluctuations on various other lines. The price quoting at present is 9 cents per pound.

Soil Pipe Prices Holding Firm

SOIL PIPE AND FITTINGS are still selling and the demand still continues. This line, especially soil pipe, continues to be very scarce and notwithstanding the fact that the volume of business is on hand very few are able to handle their offerings with prompt delivery, but are forced from the scarcity prevailing to hold up orders and frequently ship only a portion of the goods previously ordered. Labor conditions are still the main factor as most firms manufacturing these goods are just getting back to normal. Wherever a firm manufacturing several articles are held up for material in one line it often ties up their whole operation. And this holds regarding soil pipe. No increased production is looked for till the winter sets in, as it is stated manufacturers are working to capacity. However, when winter sets in it is expected to catch up with orders on account of the falling off of the demand. Prices are unchanged on soil pipe. And the general opinion seems to be that they will remain at present levels. Quotations are as follows:

Medium and extra heavy soil pipe, 2, 3 5 and 6 in.	10%
Medium and extra heavy soil pipe, 4 in..	15%
Medium and extra heavy soil pipe fittings, 2 in. to 6 in.	25%
8 in. extra heavy pipe and fittings	5%

PIPE FITTINGS

Cast iron fittings	10%
Plugs	22%
Bushings	25%
Unions, ¼" to 2½"	40%
Do., ⅛", 3" and larger	35%
Dart unions, ¼-inch to 2-inch	25%
Do., 2½-inch and larger	15%
Nipples, up to 4-inch	77½%
Do., 4½-inch and larger	67½%
Do., running thread 4-in. and under	47½%
Couplings, 4-in. and under	40%
Do., 4½-in. and larger	20%

MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittings, Class A, lb..	$0 57	$0 72
Do., Class B, lb. net	0 25	0 35
Do., Class C, lb. net	0 19	0 25

Soil Pipe Fittings Advance 5 Per Cent.

SOIL PIPE FITTINGS advance 5 per cent. This line has been in good demand for some time, with a gradual firming of prices, till finally the raise, which was not altogether unexpected. The scarcity of this commodity, due to unsettled conditions, has been given as the reason for this latest change. The prices are as here quoted: Nipples up to 4 inch, the discount is 77½ per cent.; from 4½ inch to 10 inch the discount is 67½ per cent., and running thread for 4 inch and under the discount is 47½ per cent.

Conductor Pipe and Eavetrough Hold Firm

CONDUCTOR PIPE AND EAVETROUGH show no change, and the price still holds firm. A good volume of business is being done for the season of the year. It would be hard to say at present just what the market will show, but a decline is certainly not expected. The galvanized sheet situation is still in a very unsettled condition, and notwithstanding the fact that the steel strike is ceasing to be a factor, mills are watching very anxiously the impending coal strike, which would, it is stated, have almost a more serious effect on the manufacture of different products than the steel strike.

PIPE (Conductor)

Plain	
2 in., in 10-ft. lengths, list	8 00
3 in., in 10-ft. lengths, list	9 70
4 in., in 10-ft. lengths, list	12 80
5 in., in 10-ft. lengths, list	17 50
6 in., in 10-ft. lengths, list	21 30

F.o.b. Toronto, Ottawa, Oshawa.
List less 10%.

Enamelware Still Scarce; Firm

ENAMELWARE, especially bathtubs, is a very scarce commodity. Some manufacturers felt confident that they could catch up with their orders, which were held back materially by the strike which took place this spring and lasted well into the summer. However, these manufacturers so far have not been able to catch up in this line, more on account of the increased demand than anything, it is stated.

Some manufacturers state that the plumber often books his order indefinitely, then without much notice demands the goods immediately. Then too, a great factor may be the fact that so many people have this year been forced to move into their new houses before the houses were completed, and naturally are more impatient over delays than they would be otherwise. One manufacturer stated to SANITARY ENGINEER that some plumbers had enamelware delivered on jobs that would not be ready to use perhaps for a month, and stated this was a great handicap to others who were held up for the goods.

Quotations on a few of the better known lines are:

Bath tubs, roll rim, 4, 4½, 5 feet, 24 to 30 in. wide			$37 07
Bath tubs, 5½ ft.			41 27
Lavatories—			
17x10" Apron F139 or P4045			11 05
18x24" Apron F154 or P3845 or P3847			17 00
18x21" Apron F160 or P4205			12 70
18x21" Roll rim F197, F199 or P4655-6			11 10
17x19" Roll rim F241 or P4345			9 05
Sinks, roll rim, 18 x 30 in.			16 60
Sinks, flat rim—	1 only	2 only	3 only
16 x 24	$5 40	$5 34	$5 28
18 x 30	6 20	6 13	6 07
20 x 30	7 10	7 04	6 98
Closets, oak tank and seat			26 50
Do., enamel iron or white vitro tank			30 00

Range Boilers Firm; Demand Brisk

RANGE BOILERS remain firm. No price changes are noted or no immediate changes are expected at present. The seasonable demand is said to be a strong one. Many people have moved into new houses before the houses have been completed, and now are rushing and pressing dealers to supply their needs, with the result that there is a big demand with a temporary shortage, although most jobbers can give very reasonable deliveries. Quotations remain firm and unchanged, as follows:

Range Boilers	Standard	Extra Heavy
30-gallon	$11 00	$12 50
35-gallon	13 50	15 50
40-gallon	15 25	17 25
52-gallon	20 50	25 00
66-gallon	32 00	38 00
82-gallon	40 00	47 00
100-gallon	50 00	58 00
120-gallon	60 00	67 00

Valves and Brass Goods Scarce; Remain Firm

VALVES remain firm and in some cases the demand is greater than the supply. The fact that European buyers are not in the market yet has surprised many. However, it is expected that credit arrangements will soon be adjusted and when this happens prices will soar as the scarcity of metal is being forcibly noticed under present demand. Europe will need an enormous amount of copper, it is believed, and looks to this country to supply most of it. So with her demands as well as the brisk demand already here, no lower prices are looked for. Business in connection with marine work is falling off, especially in British Columbia. Other lines, though, are reported quite brisk with a firm tone. Prices are as follows:

Compression work, standard	35
Fuller work, standard	40
Bath cocks, compression	37
Bath cocks, Fuller	40
Flatway stop and waste cocks, standard	38
Roundway stop and waste cocks, standard	38
Brass steam cocks, standard	Net List
Globe, angle and check vales, standard	5-9%
Do., removable disc	7-10%
Radiator valves, standard	15%-23%
Do., removable disc	40-46%
Basin Cocks—	
No. 0 and 1, Fuller pattern	40
Compression	30
Quick opening	40

Wrought Pipe Still Very Scarce

WROUGHT PIPE, especially the most popular sizes, is very hard to procure and the situation does not seem to be getting much better. The shortage of skelp is reported to be the main factor. It is hard to state when this situation will be relieved. It is believed eventually that it will automatically adjust itself with the falling off of the demand during the coming winter. Quotations are as follows:

WROUGHT PIPE

Price List No. 40, July 4, 1919

Standard Buttweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
⅛ in.	$ 6 00	$ 8 00	$.....	$.....
¼ in.	4 53	6 66	5 13	7 26
⅜ in.	4 53	6 66	5 13	7 26
½ in.	5 99	7 57	6 84	8 42
¾ in.	7 53	9 66	8 68	10 81
in.	11 14	14 28	12 84	15 98
1¼ in.	15 07	19 32	17 37	21 62
1½ in.	18 01	23 10	20 76	25 85
2 in.	24 24	31 08	27 94	34 78
in.	50 87	65 03	.....	.....
2½ in.	38 90	49 73	.....	.....
in.	76 85	97 01	.....	.....

Standard Lapweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
2 in.	$ 27 94	$ 34 78	$ 31 64	$ 38 11
2½ in.	40 66	51 48	46 51	57 33
3 in.	53 17	67 32	60 82	74 97
3½ in.	66 70	83 72	75 90	92 92
4 in.	79 03	99 19	89 93	110 09
4½ in.	88 00	113 00	107 00	132 00
5 in.	103 00	132 00	125 00	154 00
6 in.	133 00	171 00	162 00	200 00
7 in.	175 00	224 00	211 00	259 00
8L in.	184 00	235 00	221 00	273 00
9 in.	254 00	324 00	305 00	376 00
10L in.	235 00	301 00	283 00	349 00
10 in.	303 00	387 00	365 00	449 00

Terms, 2% 30 days, approved credit.
Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Boiler Tubes Prices Unchanged

BOILER TUBES continue to be very scarce and prices remain firm. Raw material is given as the reason some Americans have advanced their prices 70 per cent. on tubes. There is also a very unsatisfactory outlook on delivery of American tubes, and as Canada depends largely on United States for her supply of tubes, will have to conserve till conditions get more settled. Prices are quoted as follows:

BOILER TUBES—	Per 100 feet Seamless	Lapweld
1 inch	$27 00	.....
1¼ inch	29 00	.....
1½ inch	29 50	.....
1¾ inch	32 00	$27 00
2 inch	31 00	26 00
2¼ inch	35 00	28 00
2½ inch	43 00	32 00
3 inch	48 00	40 00
3¼ inch	.....	47 00
3½ inch	60 00	44 00
4 inch	75 00	56 00

Sheets and Plates Advance 25c Cents Base

SHEETS AND PLATES.—An advance of twenty-five cents over base prices has taken place, and further higher prices would not be surprising. With the steel strike well in hand producers are giving serious consideration to the effect of a possible suspension in the coal fields. Deliveries from mills are not likely to arrive in any quantities for a few weeks at least, which leaves most jobbers with stocks depleted. Some have been doing a pick-up business for a month or more, while the jobbers with slightly larger stocks are not generally selling at a premium. Some have raised slightly, which makes a varied quotation. The most standard are as follows:

BLACK SHEETS—		
14 gauge	5 45	5 65
16 gauge	5 60	5 75
18-20 gauge	5 15	6 30
22-24 gauge	6 20	6 35
26 gauge	6 30	6 40
28 gauge	6 45	6 50
3-16 inch plate	4 90	6 25
¼-inch boiler plate	4 50	5 80

Prices shown are for full cases. An extra charge of from 25c per 100 lbs. is made for less than case lots.

GALVANIZED SHEETS.

	Premier		Apollo	
10¾ oz.	8 90	9 50	....	9 25
U.S. 28	8 30	9 90	....	8 55
U.S. 26	7 90	8 50	....	8 20
22 and 24	7 70	7 90	....	8 00
18 and 20	7 50	7 70	....	7 80
16	7 25	7 50	....	7 60
12 and 14	7 05	7 25	....	7 35

An extra is now charged on galvanized sheets, 10¾ oz. and 28 ga., when shipped out in sheets 3 feet wide. The extra charged over prices shown above is 20c per 100 pounds. Other gauges show no change for different widths.

Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

Lead and Zinc Products Firm

LEAD AND ZINC PRODUCTS—Owing to the advances made in metals and the firming of tin and lead these products remain very firm. The demand, although seasonable, is very good. It would be hard to state if there will be an immediate advance, as the metals used in the manufacture fluctuate to such an extent. Quotations are as follows:

Lead pipe, list, per lb.		$0 13½
Lead waste pipe, list, per lb.		0 13½
Do., over 6 inches, list, per lb.		0 14½
Above subject to discount of 10%.		
Lead traps and bends		15%
Lead wool, lb.	0 11	0 12½
Lead sheets, 4 to 6 lbs., sq. ft., in rolls, lb.	0 12	0 13
Cut sheets ½ to ¾c lb. extra and cut sheets to size, 1c lb. extra.		
Solder, guaranteed, lb.	$0 35½	$0 38

MADE IN CANADA

MUELLER

Compound Lever Action Ball Cock

Made for High Up and Low Down Tanks

NOTE—Can be furnished with either 5/8" or 1/2" shank with tail-pieces for 3/8" I.P. or 1/4" I.P. respectively.

THE A-1270 MUELLER Compound Lever Action Ball Cock is high grade in every respect and like other Mueller Products is "Fully Warranted." All parts are made of Red Brass with high copper content; tested at 200 lbs. pressure. The hush tube on the High up Cock surrounding Cast Brass Supply Tube ensures silent action; fitted with compound lever action controlled by thumb screws. Easy access to all working parts enable repairs to be made without removing Ballcock from tank. Rigid inspection after every process of manufacture ensures perfect operation.

A-1270

H. MUELLER MFG. CO., LTD.

SARNIA CANADA

SEND FOR OUR CANADIAN CATALOGUE "A"

MADE IN CANADA

Solder, strictly, lb.	0 34½	0 37
Solder, commercial, lb.	0 32½	0 35
Solder, wiping, lb.	0 31½	0 34
Solder, wire, lb.	0 35½	0 41
Zinc sheets, per lb.	....	0 17

Scrap and Waste Materials Quiet

SCRAP AND WASTE MATERIALS.—Cast iron has shown some activity, but for the most part scrap and waste materials are quiet. It is expected this condition will not last long, providing the coal strike holds off and conditions generally settle. Quotations are as follows:

Dealers' Buying Prices—		
Tea lead	....	0 03½
Heavy lead pipe	....	0 05¼
Pipe scrap	....	8 00
Stove plate, per ton	....	12 50
No. 2 busheling	....	11 00
Yellow brass	....	0 10
Red Brass	....	0 16¾
Light brass	....	0 07
Scrap zinc	....	0 06
Heavy copper	....	0 18
Wrought iron, No. 1, per gr. ton	....	14 00
No. 1 machinery cast	....	18 00
Heavy melting steel	....	14 00
Old rubbers, boots and shoes	....	0 07
Overseas, lumbermen's rubber boots	....	0 05
Bicycle tires	....	0 1½
Automobile tires	....	0 03

Stilson Wrenches Show an Advance

STILSON WRENCHES. — An advance in this line was not unexpected as they have been firming for some time. The prices are now quoted as follows: 6-inch, $12 per dozen; 8-inch, $13.50; 10-inch, $15; 14-inch, $21; 18-inch, $30; 24-inch, $43.50; 36-inch, $81.

Waste and Oakum Holding Steady

WASTE AND OAKUM show no change. A very good demand is generally reported. Jobbers do not look for any increased prices at present, although cotton waste is unsettled owing to the advanced movement in cotton, and its products. Quotations are as follows:

	Per 100 lbs.	
Best American	$21 00	$22 00
Clipper, spun	.....	21 00
Do., unspun	....	19 50
Plumbers' spun	10 00	10 75
WASTE		
Cream, Polishing	....	0 21
White—		
XXX	....	0 18
XX	....	0 16¾
X	....	0 15¾
XC	....	0 13½
Japanese	....	0 13
XXX Extra	....	0 19
XX, grand	....	0 17¾
XLCR	....	0 16½
X Empire	....	0 15¼
X Press	....	0 14
Colored—		
No. 5	....	0 13¾
No. 1	....	0 12¾
No. 7	....	0 11¾
No. 1A	....	0 10¾
No. 1B	....	0 09¾
Fancy	....	0 15
Lion	....	0 13½
Standard	....	0 12
Popular	....	0 10½
Keen	....	0 09

Above lines subject to trade discount for quantity.

Copper Lower; Other Ingots Advance

INGOT METALS.—The tendency for the majority of ingot metals is quite firm, although most markets are very erratic on account of exceptional conditions. Copper shows a sign of weakness and is recorded at from 25 to 26 cents per pound. Antimony is on a higher level, with spelter on the Toronto market showing a firm tendency. The coal strike may prove a serious factor if it takes effect, and it would be impossible to forecast what it will do to prices. Some think it may not materially affect Canada as far as ingots are concerned as a number of large mills have tons of ingots in store.

COPPER.—Copper this week shows a weaker tendency, but this is not any indication of the actual situation as it is believed that copper producers will see to it that copper production is measurably in keeping with actual consumption.

TIN.—Tin shows no change this week although it is holding firm with satisfactory amount of business showing. Present quotations still read 59 to 60 cents per pound.

SPELTER.—The Toronto market for spelter shows a higher tone, wtih a good volume of business showing at 10 cents per pound.

ANTIMONY.—Antimony shows a new price, and, as predicted by SANITARY ENGINEER in last issue, the demand still continues favorable. The new price is 11½ cents per pound.

ALUMINUM.—There is no noticeable change in aluminum, the price still contiues firm and a fair quantity is being handled. The present quotation remains at 34 cents per pound.

LEAD.—Lead continues firm and selling at a price of 8 cents per pound. Dealers seem to have taken greater interest in the market and apparently are still laying in supplies, giving extra strength to the markets generally.

PLAN NEW WATER SUPPLY

Engineers who have charge of the solution of the water problem at Chatham, Ont., have made a preliminary report of the cost of alternative schemes for the future source of supply. It is estimated that to bring water from the Snye Carte will cost $750,000, from Lake Erie $600,000, and from the River Thames $300,000. Tests show that the lake water is the most satisfactory.

MUST INSTAL MAINS

A by-law requiring property owners to instal water main connection where their property adjoins a road on which a pavement is to be laid has been recommended at Hamilton, Ont.

A sub-committee was appointed by the Works Committee to deal with a proposal that the Burlington Street sewer be extended at a cost of $34,000 for the benefit of the Firestone Tire and Rubber Company, which desires to locate shortly in the county, outside of the city limits.

FOR SALE—PLUMBERS' SUPPLIES OF ALL makes, at prices that protect the plumber. American Plumbers' Supplies, 14 Craig St. West, Montreal.

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At a Very Attractive Price

Free Turning

Round Brass Rod

Mill lengths of the following sizes:—

	Diameter
30,000 lbs... .250″	¼″
24,500 lbs... .533″	Abt. 17/32″
62,500 lbs... .625	⅝″
73,250 lbs... .750	¾″
27,500 lbs... .9375″	15/16″
46,750 lbs...1.000″	1″
45,000 lbs...1.250″	1¼″
26,000 lbs...1.375″	1⅜″
39,000 lbs...2.000″	2″

Above is all new material stored at the manufacturers' plant in Connecticut, ready for prompt shipment and has passed Government inspection.

Box 325, Sanitary Engineer

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SIZES, 1/8 IN. TO 4 IN.

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Ask your jobber for CT *Brand of Wrought Pipe*

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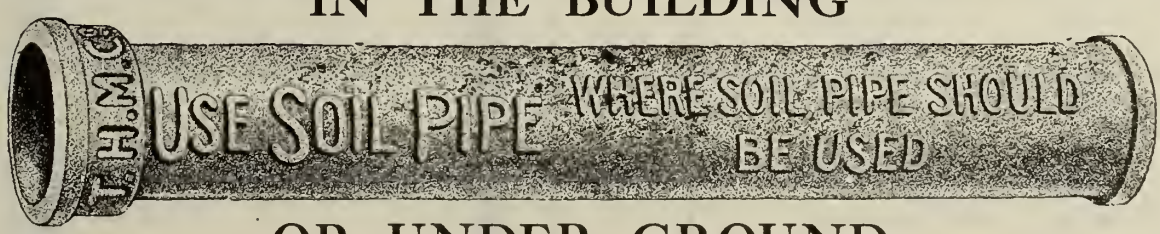

OR UNDER GROUND

ASK YOUR JOBBER FOR T.H.M. CO. BRAND OF SOIL PIPE AND FITTINGS.

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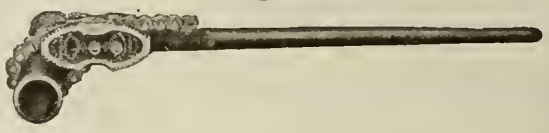
Williams' Improved "Vulcan" Drop-Forged Chain Pipe Wrench



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Made in 8 sizes for ⅛ to 18 inch pipe. All Flat Link Chains are "proof-tested" on a standard tension machine and "certified." Every wrench is unconditionally guaranteed.

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"The Wrench People"
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Agts. for Manitoba, Saskatchewan, Alberta and British Columbia.

The Wrench of 25% Greater Efficiency

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Two new features have been recently added to the Trimo Pipe Wrench, namely Nut-Guards, in all sizes, and unbreakable steel frames, in leading sizes.

The Nut-Guards prevent the accidental rotation of the nut while in use.

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All Trimo Pipe Wrench parts are interchangeable.

The inserted jaw in the handle can be readily replaced when worn, thus adding to the life of the tool.

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Roxbury (Boston) Mass., U.S.A.

The Trade K—T IE Mark

K-T

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GALT ONT.

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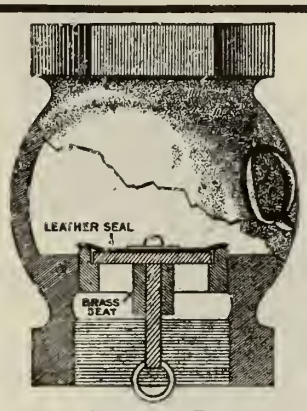

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There are more pump troubles caused by "leaky" valves than from all the wear and tear which occurs in the average life of a pump.

The "Q" valve will overcome all priming troubles, and water once raised above it, through the suction line, will not leak out.

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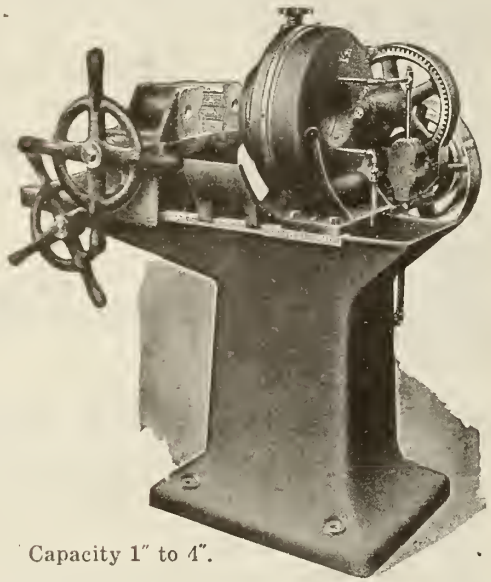

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Easily operated by unskilled help. An ideal machine for the plumber, the steamfitter or the jobber. Will thread pipe as short as 4½ inches. Let us mail you full information regarding this money saver together with catalog covering our complete line including:

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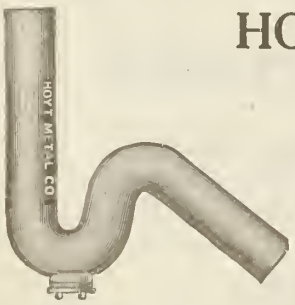
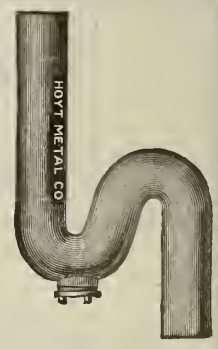
FROM COAST TO COAST



As time-savers there are none equal to our Wiping Solder, Bar or Wire Solder.

Hoyt Lead Traps, bends and waste pipe are in a class by themselves.

All our products are made to formula.



Our Mixed Metal Sales Amount To Over $5,000,000 Annually.

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HOYT METAL COMPANY, TORONTO, ONTARIO
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INDEX TO ADVERTISERS

Allison, K. B. 46
Amherst Foundry Co.....Inside Front Cover
Anthes Foundry Co..... 12
Armstrong Mfg. Co..... 48

Beaton & Cadwell..... 47
Beaton & Corbin 48
Borden Canadian Co. 48
Buffalo Specialty Co. 4-5

Canada Metal Co..... 15
Canadian Brass Co. 9
Canadian Society of Domestic and Sanitary Engineers 8
Canadian Consolidated Rubber Co. 44
Canadian Tube & Iron Co. 43
Chamberlain Desolvo Co. 47
Commercial India Rubber Co. 48

Dunham, C. A., Co., Ltd. 3

Empire Manufacturing Co. ..... Outside Front Cover

Fittings Limited 11

Gummer, G. & W. G., Ltd. 13
Galt Brass Co. .....Back Cover
Gurney Foundry Co., Ltd. 48

Hall, J. H. 46
Hamilton Stove & Heater Co. 40
Hause Mfg. Co., Chas. F. 48
Hoyt Metal Co. 46
Hungerford, U. T. 48

International Malleable Iron Co. ..... Inside Back Cover

Jardine, A. B., & Co. 3
Jenkins Bros., Ltd. 11

Katie Foundry, The 45
Kerr Eng. Co., Ltd.....Inside Back Cover

Long, R. G., & Co. 46
Lord & Burnham Co. 1

McDougall & Co., R. 45
McIntyre & Taylor, Ltd. 11
Modern Heating & Engineering 7
Moline Heat 7
Morrison Brass Mfg. Co., Ltd., Jas. 41
Mueller Mfg. Co. 39

National Steel Tank & Mfg. Co. 6

Port Hope Sanitary Mfg. Co. 16

Scaife & Sons Co., Wm. B. 45
Standard Sanitary Mfg. Co. 2
Steel & Radiation, Limited 6
Sturtevant, B. T., Co. 11

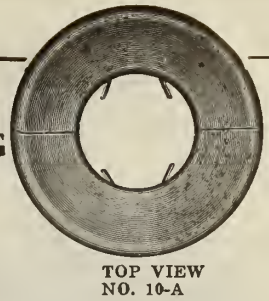
Trimont Manufacturing Co. 44
Toronto Hardware Mfg. Co. 43

United Brass Founders & Engineers, Ltd. 11

Wallaceburg Brass & Iron Co. 12
Warden-King, Limited 41
Williams, J. H., & Co. 44
Wolverine, Ltd. 45

OPEN VIEW
NO. 10-A

The CEILING PLATE that's better



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THE NO. 10—A NARROW FLANGE PLATE—IS A STEEL HINGED PLATE. FLANGES ¾" WIDE. HIGHLY FINISHED. ESPECIALLY DESIGNED FOR TWIN CONNECTION "NARROW."

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High quality at the right price.

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Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

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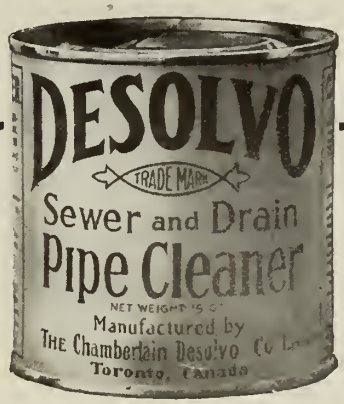

Clears Away Trouble

Desolvo is the only pipe cleaner that mixes with cold water. No heating necessary. Apply it to the pipe; heat is generated, thawing frozen pipes and cleaning all stoppages.

Saves time and money and constitutes a new household necessity that is a profitable seller.

Order from your jobber.

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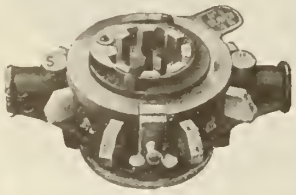

6 Beaverette to ¾ inch.

This efficient little die stock has been about 10 years on the market with constantly increasing sales.

The only tool that threads ¼, ⅜, ½ and ¾ without changing dies or bushings. Two sets of dies are operated by one handle.

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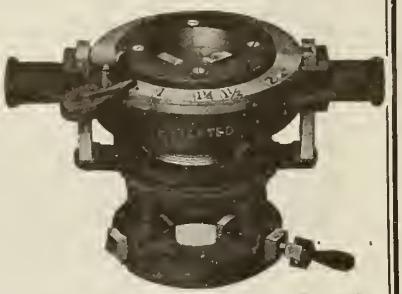

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ARMSTRONG STOCKS and DIES

Hinged Pipe Vises *Pipe Cutters*
Pipe Threading Machines

—MANUFACTURED BY—

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Puts just the right finish on that heating job

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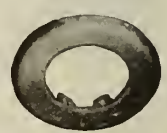

No. 17

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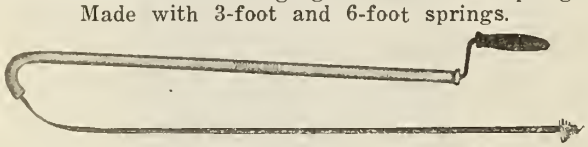
Manufacturers of the

Hause Closet Auger

Seamless brass tube—high-grade 7-16 steel spring. Made with 3-foot and 6-foot springs.



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"Star Brand" Seamless Brass and Copper Tubes

including

Iron Pipe Sizes

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Seamless Brass Condenser Tubes

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Specially prepared for Hot and Cold Water Taps. All sizes from ½ inch to 1½ inches. Soft, Pliable, and "Joint-Perfect."

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Made in Canada

The Brand that has the Quality

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With this brand mean fittings made with iron of high tensile strength—proper proportions and correct tappings.

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There Are Lots of Gate Valves

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but not all of them possess that neat appearance, combined with strength and stability, which characterizes

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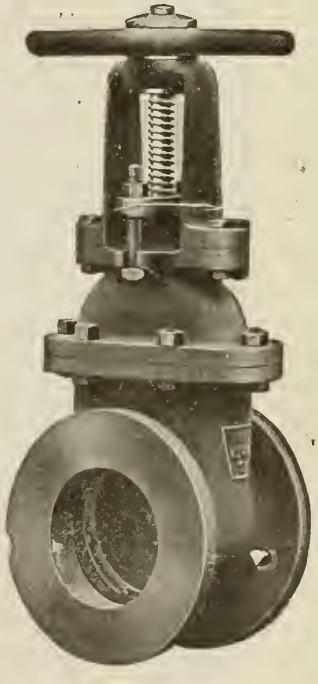

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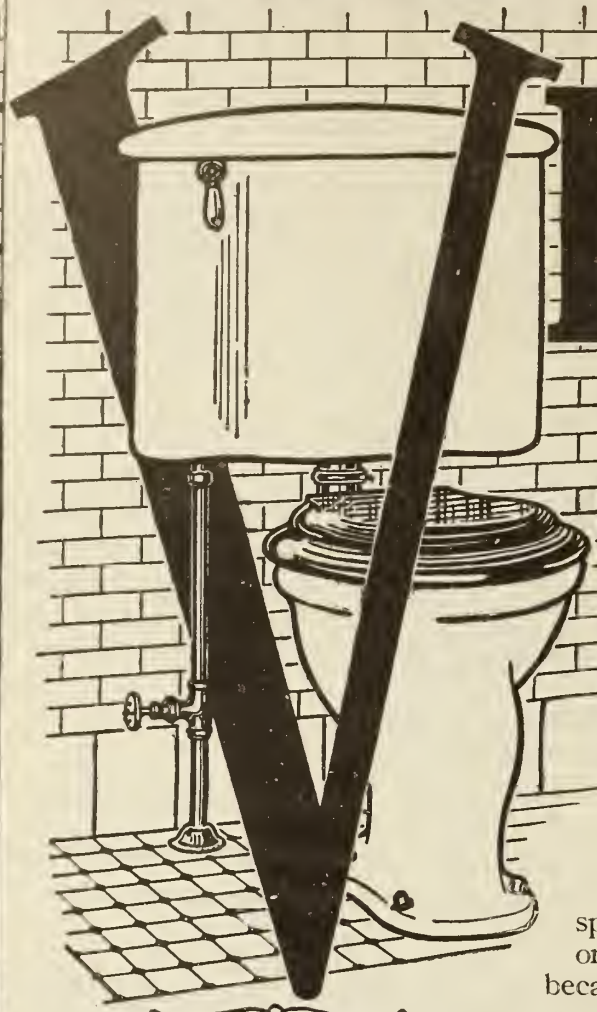

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The VitrO Tank is made all in one piece of a special composition. Needs no lining of copper or anything else. It never plays out, never leaks because it has no joints to open up, nor metal to corrode. Never gives trouble after it is once installed.

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It is a handsome tank. We make it in three finishes—for bathrooms, for basement closets, for lavatories of public buildings—wherever a tank is required.

And the VitrO Tank is guaranteed against defects of material or workmanship—absolutely. We'll take a VitrO Tank back any time a defect is discovered, providing that misuse is not the cause.

Your customers will appreciate the VitrO Tank. Experience with it will make them better friends of yours and better customers.

Guarantee

WE guarantee that should a VitrO Tank at any time prove defective through either material or workmanship, a new one will be given to the plumber by the jobber from whom he purchased it. In no case will credit be given to the jobber until the defective tank is returned and examined, and when a tank is returned same must be complete with all fittings; otherwise, credit will be given based only on the value of the goods returned.

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Specify VitrO Tanks

Catalogue on request. Write us or write your jobber.

Galt Brass Company, Limited

Galt - Canada

Sanitary Engineer
Plumber and Steamfitter of Canada
VOL. XIII. PUBLICATION OFFICE, TORONTO, NOVEMBER 15, 1919 No. 22

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London and Toronto, Canada

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While

A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

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"Perfection" Built-in Baths

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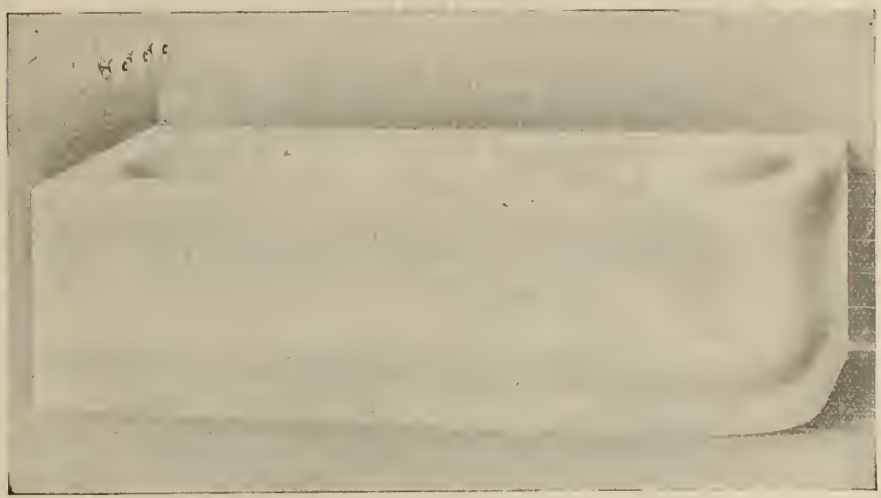

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No. 2 Vaennm Cleaner

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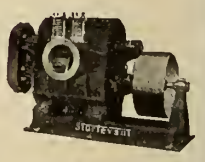

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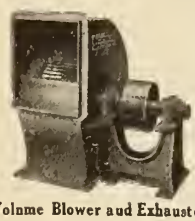

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Fuel Economizers

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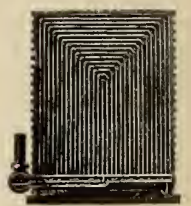

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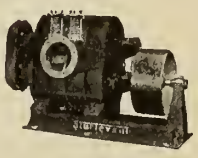

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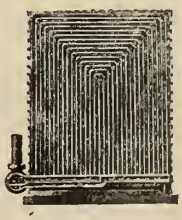

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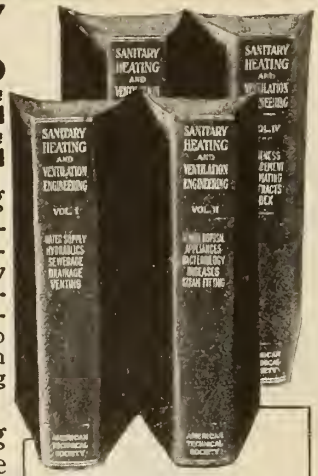

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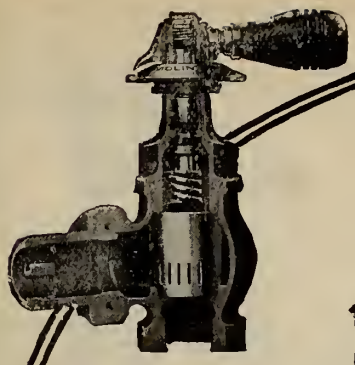

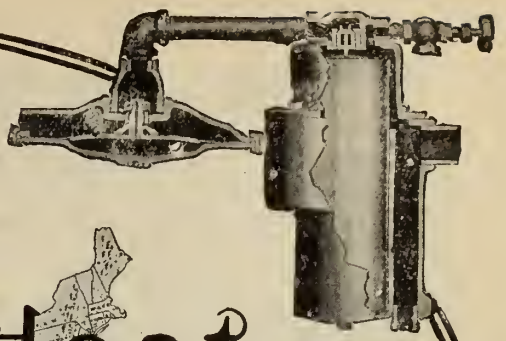

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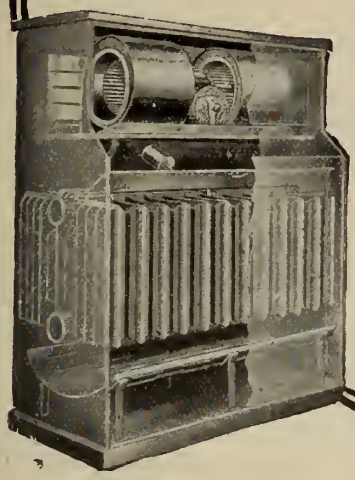

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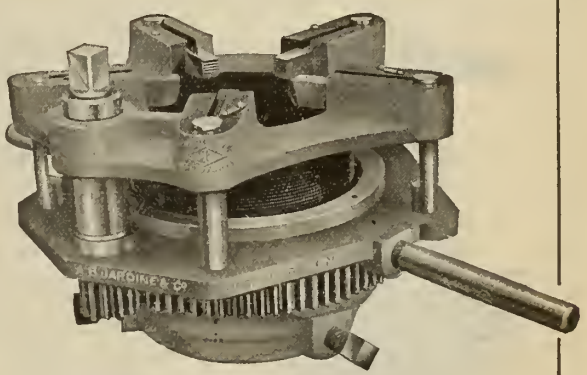

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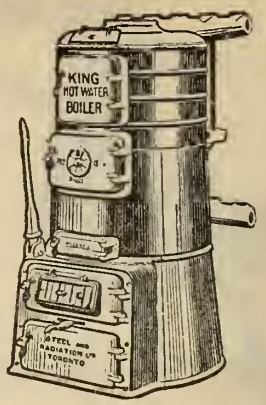

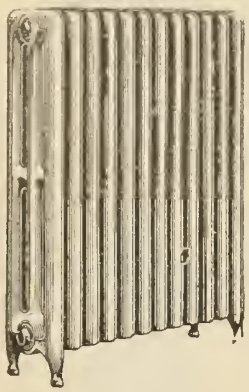

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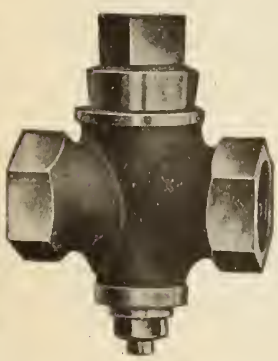

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RALPH CONNOR

On "The New Canada and Its Needs"

RALPH CONNOR, the famous Canadian novelist, who served for several years at the front and saw the war from many angles, is convinced that Canada must be prepared to make important changes if she is to profit by the lessons of the war. He has written a series of articles embodying his views and calling vigorously on patriotic Canadians to awake to the needs of the hour. The articles, which deal with economic, social and Imperial topics, were written for MACLEAN'S MAGAZINE and the first appears in the November issue, under the title: "The New Canada and Its Needs."

Every Mother Who Lost a Son at the Front

will read with deepest feeling Nellie McClung's wonderful story, "Men and Money," which also appears in November MACLEAN'S. Mrs. McClung wrote this story with a purpose—to show the ease with which the world forgets the contribution these mothers made. But it is also a very fine story—real, human and gripping.

"The Idle Hands at Ottawa"

By J. K. MUNRO

The recent session of the Dominion House was in many respects an idle one. There was not a great deal done, so the members had a lot of time to stir up things, and the result was some hugely interesting political situations. All of which J. K. Munro tells about in his usual unsparing and tersely humorous way.

Remarkable Features of a Remarkable Number

The November MACLEAN'S is cram full of other big features—famous writers on vital subjects and everything Canadian. Look over this list:

Baroness Orczy.—The author of "The Scarlet Pimpernel," best seller of best sellers, is represented by a serial story, "His Majesty's Well Beloved."

Robert W. Service.—The great poet of the Yukon and the battlefront contributes a strong poem, "The Outlaw."

Basil King.—This great novelist who lives abroad contributes an interesting discussion on "Why I Remain a Canadian."

Janey Canuck.—An article on Mrs. Murphy's experiences as the first woman magistrate in the whole of Canada.

Camilla Kenyon.—A new novelist who promises to become a great favorite, tells a humorous story of adventure, and treasure, "Spanish Doubloons."

Stephen Leacock.—A humorous sketch entitled, "My Memories and Miseries as a School Master."

"Two Men and an Idea That Grew and Grew and Grew."—By Charles Christopher Jenkins.—A sketch of two remarkable and practically unknown Western Millionaires.

"A Little Bit of Chicken Feed."—By Allen C. Shore. A bright story combining love and business themes.

"The Rainbow Death,"—By Madge Macbeth. An intensely interesting detective story.

"The Search for Missing Men."—By Gertrude Arnold. An article on hospital experiences at the front by a young Canadian V.A.D.

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"GO TO IT!"

A Little "Straight Talk" to the Canadian Plumbing Trade

A few days ago a young man in the city wrote a letter to his father who lives in a country town. It was a long letter, filled with details of a proposed new business venture; the son weighed all the "pros and cons," the dangers of loss, the possibilities of profit. He hesitated on the brink, waiting for the encouragement or the detaining hand of his senior.

The father's reply came by return mail. With few other words it read: "GO TO IT!"

This aggressive spirit is needed in business to-day—very particularly by the business men who read this paper. This is not the hour for sitting down and waiting for things to turn up, we must be TURNING THINGS UP. The field for large business is unlimited.

NEW CONSTRUCTION is proceeding and RECONSTRUCTION is everywhere contemplated. There is every reason why the Canadian plumber and heating specialist should be in the front rank of this advance, stimulating the ideas of those erecting new buildings, pointing out to owners the possibilities for increased health, comfort, and profit in the use of really modern and efficient installations.

Quality should be ever foremost. People should be shown how to get something at first that will last instead of getting the thing at last which they should have had first. Service must be always kept on a high pinnacle, never forgotten.

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PLUMBER AND STEAMFITTER OF CANADA

ESTABLISHED 1907 PUBLISHED TWICE MONTHLY

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CONTENTS

Talks to Public Through His Window Displays 15-16
4,000 New Houses Planned For Spring 17-18
Change Made in Income War Tax Act 18
Practical Talk on Vents and Venting 19
Buying in the Home Town Helps Business 20
Found Sewage Running Under Buildings 21
Editorial Comment 22-23
News From Here and There 26-27
Says Skilled Sanitarians Vital to Health of People 28
Ventilating the Modern School 29-30
Canada's Splendid Achievement 31
Says Meters Will Effect Big Saving 32-33
Discusses House Heating by Gas 34
The Question Box 35
Market Conditions and Tendencies 36-38

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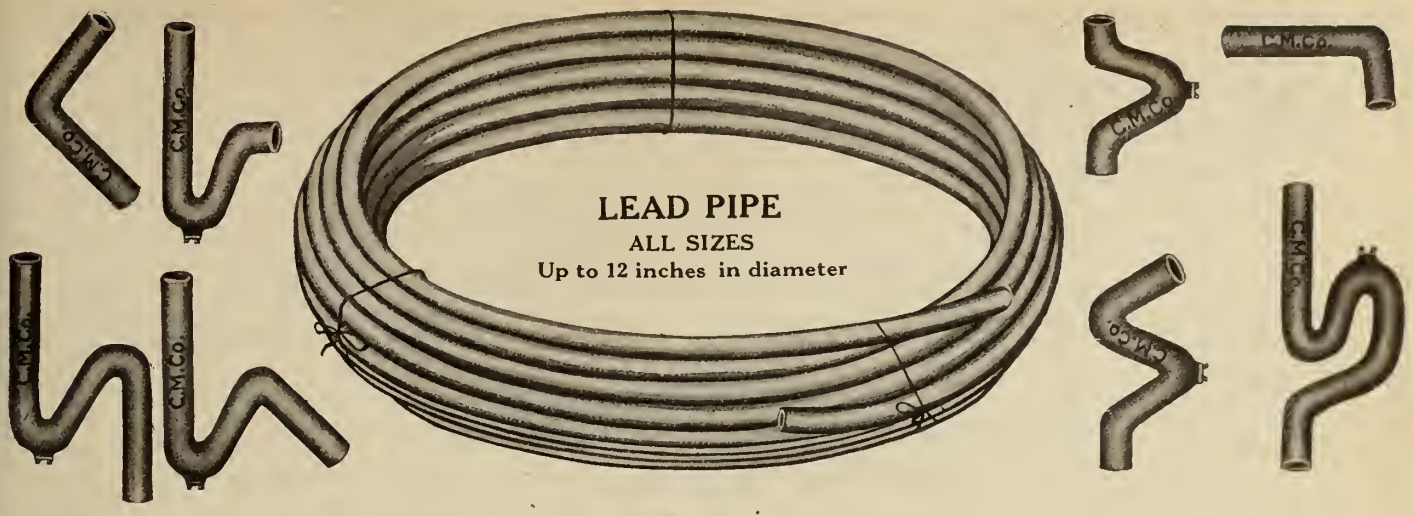

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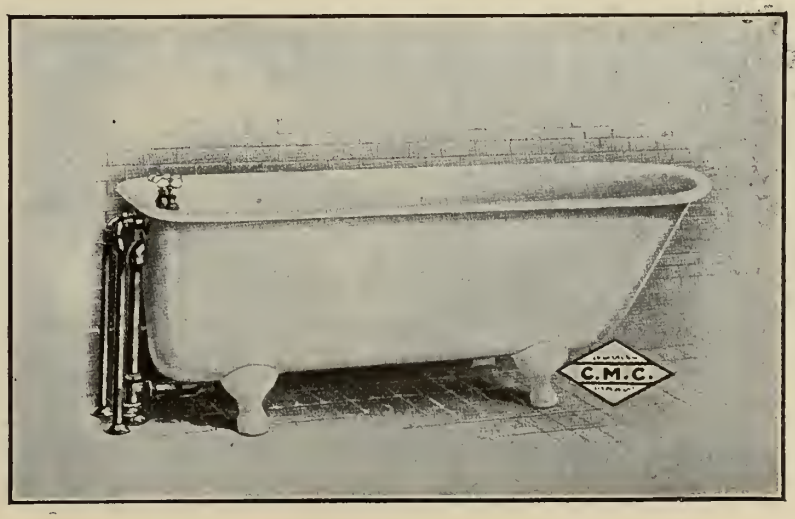

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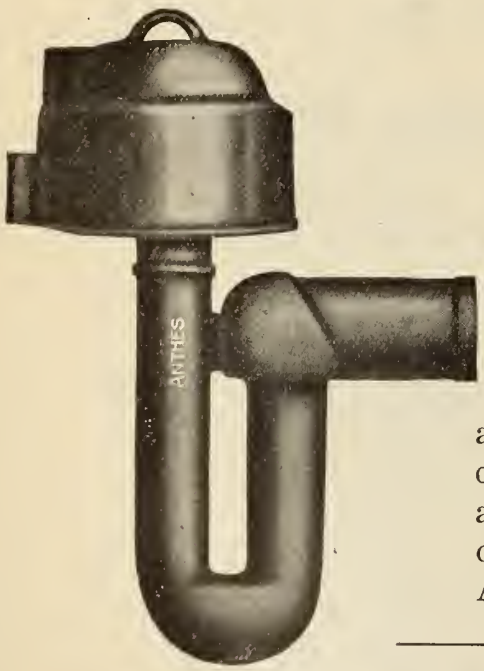

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Talks to Public Through Displays

Attractive Store Arrangement and Timely Window Trims Bring Business, Says W. F. Snow—His Windows Are Dressed Every Friday

Based on an interview by J. H. COLE, of Sanitary Engineer, with W. F. Snow, of Toronto.

"MY store arrangement and window displays do most of the talking," says W. F. Snow, proprietor of the Danforth Plumbing and Heating Co., 103 Danforth Avenue, Toronto, "and many a transient customer has accepted their invitation to come in and purchase. Once people come into the store we do our utmost to give service and satisfaction, which is our motto, and we nearly always succeed in securing them for staunch customers."

Changes Windows Every Friday

"We almost invariably change our windows every Friday. The reason for this is that the general pay day for the majority of people in this neighborhood is on Saturday. From Saturday afternoon till late Saturday night, Danforth Avenue in this vicinity is alive with people, and nearly all with money in their pockets. Naturally an attractive display draws their attention, and, as is often the case, reminds or suggests some article, which they come in and buy.

Get Acquainted With New Customers

"No matter how busy we are we try to recognize new customers and get acquainted with them. This they greatly appreciate, as the average person likes to be specially noticed and think his wants are your only concern."

A unique feature of Mr. Snow's methods of merchandising is the store arrangement. The walls, instead of being decorated in the usual way, have been covered with a good quality of pure white oil cloth, which was pasted on in a very workmanlike manner. This not only gives the effect of white glazed tile walls, but seems to create the atmosphere of a spotlessly clean bathroom. It also permits the walls to be frequently washed without injury.

Photographs Itself

Another feature is the way it photographs itself in the minds of the people. Parents often send their children on errands to this store and instruct them to go to the plumbing store "all white inside," a very profitable distinction indeed.

Mr. Snow takes great pains to have a sample of all lines of fittings and supplies that he carries, connected up to show how they will actually look when in service. Of course on account of the scarcity of supplies it makes it necessary to handle more often, but there are a few dull moments when these may be adjusted without interfering with other work, and he claims it more than pays him for his extra work, which is a pleasure.

Getting More Up-to-Date

The up-to-date plumber is getting more on a mercantile basis, he says, and the day is fast approaching when the plumber's method of keeping

An attractive showing of goods of this kind is a big help in boosting business. The stock is kept in spotless condition. In the accompanying story will be found details of the simple plans used by the firm to obtain the snow-white walls which make such a splendid background for the equipment on display.

Window displays are regarded by the Danforth Heating and Plumbing Company as one of their very best means of advertising. The windows are kept looking their best and are changed regularly.

his store or show rooms in a litter will be ancient history. Women do not care to soil their clothes by coming in contact with old coils or furnace repairs, or to be tripping over stock that should have been neatly displayed. Many merchants think the average window too small to display plumbing supplies, whereas a small window is a great advantage, taking a much smaller stock to dress it, and also allowing the merchant to specially feature one particular article. Numerous merchants in different lines are adopting this method of putting in a whole window of one article, and claim excellent results.

Mr. Snow is very enthusiastic about displaying goods, and thinks there is no line shows up more favorably than sanitary plumbing and supplies. Then again, the window takes the place of a show case and shows to even greater advantage. Many plumbers put nickel-plated and polished brass goods in a show case, but will not put them in the window for fear they will look shop worn, but by changing windows regularly, the short time they would be exposed would hardly affect their appearance. People are often changing districts, and often look for a window or sign of some kind to show them where they may secure goods or leave their order for plumbing. Naturally if they see an up-to-date, attractive window display asking for the very business they are anxious to get off their hands, they will be doubly impressed and will often go out of their way to patronize such a merchant. Once they have dealt with him, the impression he creates is that he is very particular about his own store, and he surely must be particular about any work he may do for them.

Store Reminds Some That They Owe the Firm Money

Another feature Mr. Snow pointed out to SANITARY ENGINEER, was the way his window displays and store arrangements remind people of their weekly accounts. The firm does a large business in general repair work as well as contract work, and allow customers to run weekly accounts. Many a customer has remarked, "I would have forgotten all about paying my account had it not been for your attractive window display or your pure white store," or some similar remark, says Mr. Snow, "so you see I am naturally enthusiastic over showing my wares, and I think sanitary supplies one of the most attractive lines when properly displayed. The nickel-plate and pure white enamel of porcelain appeal to nearly every woman, and where is there a good housekeeper who does not like to polish brass taps, etc.? She seems to think she has accomplished something when she sees the lustre gradually coming up under the polishing cloth, till finally it glitters.

Haggling Days Over

Like most merchants, he has found that higher prices of merchandise in comparison with normal times does not depress sales or seem to make goods harder to market. On the contrary, he claims that the scarcity of goods and the fact that prices have been so active, make most customers forget about prices to a certain extent and makes them more intent on procuring the goods. The general opinion seems to be that at one time the buying public was very canny, buyers thinking no doubt that by waiting a few weeks the bottom would fall out of the market in general and prices would tumble, perhaps to their old level. Picture then the disappointment as well of "some" merchants, when prices on the very goods they had immediate use for, instead of dropping, kept on climbing steadily upwards. A few experiences such as these have educated the people to purchase while goods are obtainable. It might be mentioned here this this relates to the general tendency of the buying public throughout most of Canada. Numerous merchants report that people are buying a better quality of merchandise, figuring that a cheap article means considerable outlay anyway, and for a slightly greater expenditure they can secure the better article and have longer and more satisfactory service without having to put up with some of the disadvantages of the cheaper article.

Men Very Busy

Mr. Snow keeps a large staff of men and reports an exceptionally busy season.

Asked by SANITARY ENGINEER if he had any trouble securing goods, he stated that he had considerable trouble at times, but by hustling and keeping after deliveries, he mostly managed to give satisfactory service, in fact, thinks a little better than the average.

A very profitable way of handling contract work, he says, is to cover for the heavy wares at the time the contract is accepted, and when the job is ready to start, have material shipped direct to the job. This not only saves two cartage charges, but eliminates a lot of handling and hauling, also conserves space in warehouses, which leaves space for other purposes.

Due to Early Training

"I have reason to look back with satisfaction on my early training," says Mr. Snow. "I learned my trade under the thorough methods of W. K. Beairsto and Chas. D. Kirk, Sydney, Nova Scotia, although I understand they have located in Wininpeg since. When I first started with W. K. Beairsto I thought I was running in opposition to the Gold Dust twins, as I was continually kept dusting and polishing and moving stock around, and then more cleaning, polishing, dusting, etc. It wasn't long, however, till I saw the benefit of cleanliness and system, and now I am trying to pass it on to the boys."

New houses like those shown above, comfortable, well-built dwellings, are being erected in large numbers in various parts of the country and the call is always for more to relieve the shortage. This activity in building offers splendid opportunities for hardware merchants, not only in selling building materials and tools but in supplying the needs of those who are going to live in the new homes.

4000 New Houses Planned for Spring

Are You Ready to Take Care of the Rush of Business That is Coming? — Record Demand for Hardware and Plumbing Goods is Expected — What the Housing Commission is Planning for the Future

CONSIDERABLE impetus to many lines in the hardware and plumbing trade has been given during the past eight months because of the Ontario Housing Act, which is responsible for the completion and occupation of some 400 houses since last April, and which will result in the completion and occupation of 1,500 houses by the end of November. A still greater impetus will be felt next year when, according to J. A. Ellis, Director of Municipal Affairs for Ontario, on whose shoulders the responsibility falls for directing the whole provincial scheme, some 4,000 houses will be built.

Good Class of Houses

What this has meant to the trade can be judged from information given by Mr. Ellis to SANITARY ENGINEER, in which he stated that in the case of 90 per cent. of the houses built or now under construction existing sewerage systems or adequate water supply have made it possible and desirable to install high-class bathroom fixtures and other sanitary conveniences. In the case of two-thirds of these houses, hot-air furnaces have been installed and where the furnace has not been used, high-grade heaters are being purchased by the owner.

$12,000,000 In the Spring

While 93 municipalities have already come within the provisions of the Act, the Government has assumed financial obligations, as yet, in only 83 of these, obligations amounting to $10,620.000. Actual cash advances have been made amounting to some $4,000,000; and plans already under way will mean a further demand upon the provincial purse to the extent of $12,000,000 by next spring.

Not a little of the success of the Ontario Housing scheme is, according to Mr. Ellis, due to the fact that the widest possible choice has been given the prospective builder in the selection of his style of house. This refers particularly to the exterior of the building. The interior may not vary to any great extent; but the Government experts have prepared many plans showing different plans for the exterior. This avoids the danger of erecting a long line of houses identically the same in appearance; incidentally, it helps to keep up the value of the property, because a prospective purchaser wants something just a little different from his next door neighbor.

Local Conditions

Discussing with SANITARY ENGINEER the building of these houses and the effect upon the trade. Mr. Ellis said that each municipality was treated, as much as possible, according to local conditions.

"Where there is a sewerage system," he said, "we insist upon them connecting with it and installing all sanitary conveniences. Where there is no sewerage, we advocate septic tanks where the soil is suitable; and where there is neither of these we approve of a closet which, in turn, must be approved by the Provincial Board of Health. In 90 per cent. of these cases there is either sewerage or water connection. With regard to the sanitary conveniences and water supply, we have insisted that the best that can be done shall be done under local conditions. My policy has been to get the best possible results under local conditions.

Hot Air Heating

"With regard to heating, the furnaces installed for this class of house are exclusively hot air furnaces. We do not insist upon a furnace being installed, but allow the house to be heated by stoves where the owner prefers it; but in the latter case we do insist upon the house being so constructed that a furnace can afterwards be installed, if so desired, without any structural alterations. I should say, roughly, that perhaps two-thirds of the houses built or under construction this year are equipped with hot air furnaces."

Mostly $3,000 Houses Built

Mr. Ellis was questioned regarding the cost of the majority of the houses that had been built under the Act. "As a matter of fact," he said, "our limit is $3,000 for frame, stucco or brick veneer; $4,000 for a house of solid construction, that is, solid brick, stone, hollow tile, or concrete. These were the limits fixed by the Act when passed last March. Since then it has been found that the cost of construction has increased at least ten per cent. and, perhaps 15 per cent. all over the province. However, taking this into account, I think the only change necessary is to make a loan of $3,500 or $3,600 for brick veneer, leaving the other limits as they are.

Few Brick Veneer

"The 1,500 houses that have either been built or are nearing completion have been built within the limits of the Act but we have had very few brick

veneer houses. I should say that two-thirds of the houses are $3,000 or less; and the balance are solid construction, or $4,000 houses. What we find by experience is that the cost of a brick veneer house is several hundred dollars more than the frame house, but that the cost of the solid brick house is only two or three hundred dollars more than the brick veneer. My conclusion is that where people can afford it they should build houses of solid construction, for under present cost of construction, they are getting more for their money than in any other way. The reason why there is so little difference between frame and solid brick is that lumber is so abnormally high in price."

Will Prepare Many Plans

"I intend at the beginning of the year," said Mr. Ellis, in referring to the work that had been done as a guide to the work of the future, "to get out a report showing exactly how many houses have been built in each municipality, and the class of construction and what the cost has been. There will also be photographs of the houses actually constructed and the plans of the same. I hope to have about thirty or forty of these so that the people will know exactly what the cost has been for each kind of house.

Plans of Heating and Plumbing

"In addition to these, I have had plumbing and heating plans of the six-roomed house prepared which I also intend to have published. The keynote throughout has been to get the very best in everything with the minimum of cost to the builder. New Toronto is just about finishing 60 houses of solid construction which are costing not more than $3,200 or $3,300 each. Port Credit has also a number of six-roomed houses of solid construction, costing them about the same price."

Change Made in Income War Tax Act

Important Amendment Provides for Penalties for Those Not Making Returns as Required by Law—Time for Giving Information Has Been Extended

AN important amendment to the original act regarding income war tax has been made. It will, in one respect, alter the machinery by which the Act is enforced. Instead of imposing the penalty of a fine collectible in the courts of the land, a departure is made whereby this penalty is collected in the same manner in which taxes are assessed and collected.

The New Clause

The clause reads:

"Every person required to make a return under sub-section one of this section who fails to make a return within the time limited therefor, shall be subject to a penalty of twenty-five per centum of the amount of the tax payable, and every other person who is required to make a return under the provisions of this section who fails to do so within the time limited therefor, will be subject to a penalty of ten dollars for each day during which the default continues, and all such penalties SHALL BE ASSESSED AND COLLECTED FROM THE PERSON LIABLE TO MAKE THE RETURN IN THE SAME MANNER IN WHICH TAXES ARE ASSESSED AND COLLECTED."

Time Is Extended

This clause, of course, refers to the returns to be made for the present year. There is also one other change in the Act with reference to the time when such returns must be filed with the proper officers. This time has now been extended to the thirtieth of April, and all 1919 returns must be forwarded to the proper authorities by that date.

An innovation in taxation like the Income War Tax naturally has required and has received a good deal of leniency in enforcement. Under the provisions of the Act, as originally passed in 1917, no obligation rested on the officers of the Crown, whose duty it became to enforce it, to give any notice whatever to those liable for the tax. It was specifically set out that,

> "Every person liable to taxation under this Act shall, on or before the twenty-eighth day of February of each year, WITHOUT ANY NOTICE OR DEMAND, deliver to the Minister a return.....of his total income during the last preceding calendar year."

Took Precautions

Recognizing that the Act was an innovation in taxation, extra precautions were taken by the Government to see that it would not become necessary, in the working out of the Act, to impose the penalty prescribed, namely, a fine of "one hundred dollars for each day during which the default continues"; and, in the case of false statements, "a penalty not exceeding ten thousand dollars or to six months' imprisonment, or to both fine and imprisonment." Notices have been sent out by the officers of the Crown ever since the Act came into force, not once but two and three times, to persons who, either knowingly or unknowingly, have failed to file the proper information with the Income Tax Commissioner or such other person deputed to receive the information.

Were Not Imposed

While a complete record of fines and convictions under the Act is not available to the public, it will probably be found that the extreme penalty of the law, or anything like the extreme penalty, has never been imposed. Justice has been tempered with mercy, and the exact letter of the law has not been carried out. Ever since the Act came into force, the daily newspapers have contained notices, at the proper time, of the provisions of the Act and the penalty of failing to comply with it. So far, there have been few, if any, cases of conviction due to absolute ignorance of the law, but rather to an unwise determination on the part of the person fined, to refuse to forward the proper information to the officers of the Crown.

Houses Put In Sanitary Condition, But Now It is Claimed Rent is Much Higher

ACCORDING to press reports from Hamilton there is a great deal of work to be done because of the number of houses bare of sanitary conveniences. The matter came up when, following a visit by an inspector of the Board of Health, the C.N.R. closed some of its houses to put them in a sanitary condition. The tenants are complaining, now that the houses are reopened, that rents were boosted $5 and $12, and in some cases $15 a month.

The Hamilton "Herald" says regarding the matter:

"When apprised of this fact to-day Dr. Roberts, M.H.O., indignantly exclaimed: 'Rotten' is not a strong enough word to describe such injustice. There is no reason why tenants be penalized because landlords fail to provide sanitary homes and are forced to clean them up. Such high-handed action on the part of the owners isn't going to deter us from continuing to do our duty by inspecting and condemning houses, but there should be some power to prevent exorbitant rents being charged.

"Rentals could quite easily be controlled by the Government, and an equitable scale of rents could be fixed. If they were based on the assessment, not the investment, the assessors could go to grasping landlords and say, 'You're getting a big rent for this place, so we'll have to put your assessment up,' said Dr. Roberts. 'It is quite a common thing for landlords to boost the rent

Continued on page 27

Practical Talk on Vents and Venting

Inspector Kirk of the Toronto Civic Plumbing Department Outlines Problems at Meeting of the West "Ender" Club—Declares "Local Vent" is a Good and Very Useful Device

Written for Sanitary Engineer by C. E. PARSONS

AT THE regular meeting of the West "Ender" Club in Toronto, Inspector B. Kirk, of the Plumbing Department at the City Hall, gave a most interesting and practical address on "Vents and Venting." By means of diagrams drawn on a blackboard, he illustrated various matters in connection with questions that were asked and explained them fully. Inspector Kirk's address was as follows:

"Vents and venting as related to the plumbing trade derive their chief interest for us from their close relation to the trap, that device so hoary with age that I could not venture a guess as to the date of its introduction into the mechanism of a plumbing job.

"Let it suffice for us, however, to consider its functions as related to the sanitary appliances of a house or building. As the waste from the domestic appurtenances of a house is expelled because of its offensive nature, there is a natural desire to provide against the return of any portion of it even in the form of odors, which, from the fact that it is waste matter and that it possesses an inherent tendency to adhere to the inner surface of lining of the pipe or conduit through which it is discharged from the house, it follows that decomposition must set in and give off offensive odor.

Flushing Will Help

"Liberal dilution and flushing with clean water will minmize this evil but cannot remove it. Some means must be found to bar the entrance of such offensive odors into a building. Doubtless many devices had been tried before our old acquaintance, the trap, was adopted. It possesses so many advantages that we are not surprised that it has so long remained the favorite; its name is a misnomer, and its design and shape is such a mystery to the uninitiated householder that the workman who installs it could as easily get away with the reputation of being a wizard as that of a sanitary engineer. The design is such that it automatically permits the free discharge of liquid refuse and its short column of water presents an effective barrier to seal against the entry of gas or odor into the building.

Equal Air Pressure

"As an effective seal, however, it is entirely dependent on the maintenance of an equal air pressure on each side of it, that is on the surface of the water in the inlet side and on the surface of the water in the outlet side, and to maintain these essential conditions in an effective water seal-vents and venting becomes a necessity.

"It had long been known that the seals of traps were broken or rendered ineffective by syphonic action, but the precaution of resealing by a slight afterwash was considered sufficient until the futility of depending on such uncertain vigilance led to more thorough treatment of the whole question of house sanitation, which culminated in adding to the already mystical arrangements of a job, the further seemingly intricacies of a series of pipes, which, to the bewildered house-owner, seemed to begin nowhere and end at the same place.

Had Many Vents

"I recall an incident illustrative of this. I had installed a Zane plunger closet, trap below floor, as for pan closet, and as the overflow from reservoir was an effective automatic back water valve, there was no escape for air confined between the solid plunger and the trap below, a relief vent was provided, which we called a 'plunger vent.' The trap was a 'back vent'; there was also a local vent, which we called 'seat vent.' Then there was the fresh air inlet we called a 'foot vent,' and the soil pipe through the roof we called the 'sewer vent.' The bewildered owner, desiring to get acquainted with the names of the various pipes he was going to live with, made due enquiry concerning each pipe as we came to it. Water pipes and waste pipes occasioned no remark, but each vent pipe was regarded with great curiosity and wonder, and when we had gone over them all, he said: 'Well, I never knew there were so many kinds of vents.'

A Useful Device

"I think, however, it will be conceded by all thoughtful plumbers that our much-abused 'local vent' is a good and useful device. So also may we take it for granted that, while there may be instances where the venting of a trap may seem to be superfluous, as a general rule it is a wise and beneficent rule to require each trap to be vented.

"The fresh air inlet comes in for much criticism, and its utility or desirability is frequently debated, with the odds fluctuating from one side to the other and vice versa.

"The soil pipe continuation full size through the roof, is, I think, universally conceded to be a necessity.

Require Much Thought

"In venting of traps and in the arrangement of the vent pipes, branching in below level of fixtures and increasing sizes to secure efficient and ample movement of air, allowing for such retarding influences as friction, freezing of pipes exposed to cold, etc., require much thought, and the civic authorities find it very difficult to frame regulations which will at the same time provide security against unsanitary conditions and keep the cost of installation within the means of citizens.

"Continuous vents are now in vogue to some extent in Toronto, but the expansion of that practice by what is known as return venting, connecting lateral ends to vent stock, is popular."

PRICE MAINTENANCE QUESTION STILL IN COURT

When Colgate & Company won its decision from the Supreme Court of the United States and established the legality of what has since come to be known as the "Colgate Plan" for meeting price cutting, it was thought by many interested manufacturers that the matter had been settled and that the means were at hand for preventing the cut-rate dealer from pursuing his course without resort to special legislation to meet the trade evil.

Even this decision left a loop-hole, since the "Colgate Plan" merely provided that the manufacturer should refuse to sell to dealers who did not maintain the manufacturer's list price. It did not meet the possibility that a dealer who, though in his own retail trade maintaining the manufacturer's price, might sell to another who would resort to price cutting.

In its sales policy the Beech-Nut Packing Company has made this extension of the "Colgate Plan" and is now haled into court because of it. What is perhaps more important to all manufacturers is that the entire principle of the "Colgate Plan" is challenged, despite the fact that it has been sustained by the Supreme Court. The present action lies against the Beech-Nut Packing Company for violation of a law other than that on which Colgate & Company won their decision. It is now the Federal Trade Commission that declares that the Federal Trade Commission Act, rather than the Sherman Law, is violated and it has issued an order requiring the Beech-Nut Packing Company to desist from its practice of refusing to sell to the price cutters.

From this order the Beech-Nut Company has appealed, and the case will be argued before the United States Circuit Court of Appeals sitting in New York in October, Hon. Charles Evans Hughes appearing for the packing company as he did previously for Colgate & Company.

Buying in Home Town is Economy

By E. M. TROWERN, Secretary, Dominion Executive Council, the Retail Merchants' Association of Canada, Ottawa

IF a city or town is good enough to live in, and good enough to take a salary from, it should be good enough to buy in. If the teachers, the preachers, the professors, the firemen, the policemen and the civic servants want increased salaries, the most direct route to bring about that desired end is to keep the money circulating in the home town. If all the money in Canada ever got into the hands of one or two men, business in general would stagnate. The proper and healthy condition is to have money circulated so that everyone will, through his or her industry, get some of it.

The first expectation of a producer is to be able to sell his crop after it has been grown. To sell it he must have customers, with money, who are able to buy it. The further the producer is away from the consumer the more the transportation costs. Farms near thriving towns and cities are more valuable than those which are isolated in the backwoods. The best way to make backwoods farms valuable is to buy in the cities and towns near them.

Co-operation Counts

Prosperous cities and towns are built up through proper co-operation between retail merchants and their customers. They must work together. The customer requires the retail merchant, and the retail merchant requires the customer. If customers send all their money away to mail order houses for staple goods and expect the corner store to live on the sale of lamp chimneys, eggs and coal oil they will awaken some day to find the little store closed. Goods when you want them and where you want them are worth more than goods thousands of miles away. Ten cents' worth of toothache gum in the corner drug store in the home town is worth more to a suffering child with an aching tooth than ten tons of the same article in Hong Kong, China.

A Double Mission

Retail merchants endeavor to locate in places where they are required. They have a double mission to perform; they buy goods to suit their customers and they expect to make a living by selling and caring for them. The better service a retail merchant gives his customers the better business he should receive in return. The service should be mutual and the customer should be equally anxious to see that the retail stores in his city or town succeed.

The statement that by buying through mail order houses you are saving the middleman's profit on all you buy is only a glaring deception, to say nothing whatever about the question of lack of loyalty to your home town. Let us follow the process and see if less labor is required. A person living in a town, and whose position depends upon the prosperity of the town, receives a catalogue. In order that the said catalogue should reach the person the following process must take place:—

1. The catalogue is designed.
2. Printed.
3. Cuts made.
4. Delivered to the mail order house office.
5. Addresses secured.
6. Catalogue wrapped up and addressed.
7. Stamped.
8. Placed in the mail bag.
9. Mail bag taken to the station.
10. Carried on the train.
11. Taken off the train.
12. Taken to the Post Office.
13. Delivered to the customer in the town.
14. The customer spends time reading it over and selects an article.
15. Writes a letter.
16. Secures Post Office Order, or encloses the cash and takes the risk.
17. The postmaster enters it up and puts it in the mail bag.
18. The mail driver takes it to the station.
19. Mail clerk in charge of the train delivers it at the other end.
20. Post Office delivery wagon clerk delivers it to the Post Office.
21. Postal clerk checks it and sorts it ready for the postman.
22. Postman delivers it to the mail order house.
23. Mail order house clerk opens the letter.
24. The bookkeeper credits the cash.
25. The order clerk selects the order.
26. Stenographer acknowledges the receipt.
27. The shipping clerk mails away the order.
28. The postal clerk sorts it out for the mail delivery.
29. Places it on the train.
30. Mail clerk takes it off the train.
31. Delivers it to the local Post Office.
32. The underpaid postmaster delivers it either direct to the customer or gives it to the rural mail delivery service that is costing Canada a large sum of money to mostly benefit mail order houses.
33. The customer receives the article, and after a careful examination, finds that he or she could have bought a better article in the home town and have had the good will of the retail merchant, and helped to build up the home town by keeping the cash in local circulation.

No Economy

No sane person could say that there is any economy in that system of doing business, especially when fourteen transactions out of the thirty-three are made by the Government mail order service at less than cost price, thus benefiting the mail order house proprietors at the expense of the whole people of Canada.

True economy and sound patriotism, therefore, call upon every loyal citizen of Canada to patronize his home town and keep the wheels of commerce moving in the direction in which most persons can be mutually benefited.

Found Sewage Running Under Buildings and Many Toilets Not Connected

Report of Plumbing and Sanitary Inspectors is Expected to Result in Big Clean Up at New Westminster, B.C.

SOME extremely interesting developments that will likely make for better sanitary conditions and also remove what is alleged to be a serious fire menace, are expected at New Westminster, B.C. The council recently asked for reports from the plumbing inspector and the sanitary inspector regarding conditions in Chinatown at New Westminster. Press reports regarding the matter are as follows:

Chinatown in the Limelight

"A report was received from the plumbing inspector and the sanitary inspector on buildings in the blocks bounded by Columbia, McInnes, Carnarvon, and Blackie Streets, as instructed by the council at its last meeting. This report stated that with the exception of the Cunningham and Quong On Wo blocks, the buildings are in a most unsanitary condition. In places the inspectors found sewerage running under the buildings. Some toilets were not connected, and others so badly out of repair as to be useless. There is a lack of ventilation in rooms used for sleeping purposes, and the conditions generally are unhealthy.

Unfit for Habitation

"Ald. Dodd said he did not wish to insist on any drastic action. He had tried all sorts of motions, but always with the same result. These buildings are unfit for habitation, and are violating every law, municipal and provincial, that can be violated. Why should the council wait to be told its duties by some provincial or Dominion officer? There are some people in the city, he declared, who are saying that the council is unfit to look after its own business, and he had to confess that in this matter it appeared as if the council really was unable to enforce its own laws.

"Ald. Johnston thought that if the owners of these buildings are flagrantly violating the law there should be no need for city officials to write to the council about it. Merchants are frequently hauled into the police court for some very slight misdemeanor. Why is the same course not pursued in this matter?

Fire Protection

"Ald. Kellington declared that there was no doubt some of these buildings must come down as a measure of protection against fire. He suggested that the council wait till it had a report from the Dominion fire prevention officer, who is due here shortly. Then, with that and the report of the provincial fire prevention officer and one from Fire Chief Watson, the council would be able to proceed on an intelligent policy.

"This Ald. Dodd flatly declared was merely a move to delay matters and block efforts to have these buildings removed.

"It was finally decided on a 3-3 division by Mayor Gray's casting vote, to invite to a council meeting on November 17 the owners of all buildings in the block bounded by Blackie, Columbia, McNeely and Carnarvon. This is the block in which are the merchants and cosmopolitan hotels. These owners, most of whom have already been before the council, will again be asked to show cause why their buildings should not be torn down.

Wants More Included

"Ald. Lynch objected to picking out this block on the ground that it does not include the building on which a life first expired. He asserted that a building in the next block was first to be condemned. On his motion, it was decided to invite also the owners of all buildings in this other block, on which a life had been placed to attend the same meeting, although Ald. Dodd again declared that this was a move to block proceedings by bringing in too many owners to handle successfully in one evening.

In due course of the debate, Ald. Dodd said that if the present council does not tear down these buildings the "Purity League that is coming in" will do it.

Sewage Disposal Plant Recommended for the Town of Lindsay

Engineer of Provincial Board of Health Makes Investigation and Reports Serious Pollution of the River

ENGINEER DALLYN, of the Provincial Board of Health, has submitted a report on a new system for sewage disposal planned by the town of Lindsay, Ont. He points out that at the present time no less than five sewer outlets drain into the Scugog River, causing great pollution. He suggests that it will be more economical to construct three disposal plants than to operate several pumping stations to force the sewerage to one plant at any of the available sites.

The machinery required for compressing air might be located at the waterworks pumping station and looked after without employing additional attendants.

The immediate problem is the outlet for the South Ward sewerage system.

The report says in part:

"My suggestion is that a concrete structure suitable for the activated sludge sewerage disposal system be constructed on a small lot, owned by the town, opposite the locks, and that provision be made for diverting the drainage from the two existing outlets which are just to the north of this point.

"From the proposed works a new outlet could then be constructed capable of discharging the combined flow some little distance down the stream past the shallows. The South Ward system, as constructed, could drain to the tank to be subjected to sedimentation until such time as the more extensive treatment by the activated sludge process is required by the town.

"I do not see that the suggested concrete structures would impose an unreasonable burden on the municipality and interfere with the South Ward system being proceeded with at once."

Conserve Supplies of Galvanized Sheets is Advice of Manufacturer

THE following announcement regarding the galvanized sheet situation and the outlook for the future is being sent out to the trade by the Dominion Sheet Metal Corporation, Limited, of Hamilton, Ont.:

"Our stock is practically exhausted and we cannot hope to get in any considerable amount of steel from the lone Canadian producer, from whom we secure their limited maximum. The U. S. mills are shipping nothing, notwithstanding reports of partial operation.

"We caution you to observe the greatest conservation in disposing of your stock, as it will be three to four weeks after the strike ends before new supplies are available."

Discussing the matter with SANITARY ENGINEER, Mr. A. T. Enlow, President of the Company, said:

"I understand that the Steel Co. of Canada is loaded up for the entire balance of this year, selling only occasional small orders from stock at a good stiff advance. I firmly believe that the main trouble will come after the strike is over and the mills start operation and people will begin to expect goods, whereas nothing will reach Canada of any importance until three or four weeks, at least, after operations have been resumed in general.

"The occasional carload that straggles through is just about like a small chicken bone to a hungry Airedale dog. It only makes him seem hungrier."

EDITORIAL COMMENT

EDITORIAL BRIEFS

COURTESY costs nothing and is an invaluable help in building up business.

* * *

EVERY man who is selling goods needs three kinds of faith—first, faith in himself; second, faith in his store, and third, faith in the product he is selling.

* * *

DON'T underestimate the importance of customers because you see so many of them all day long. Remember, every dollar you get comes from the great shopping public.

THAT manufacturer who predicted that the price of shoes is going to come down April 1, might have been believed if he had named any other date.

* * *

BE very careful regarding credits. Use money and credits wisely as they are among your first requisites for making business either a success or failure.

* * *

MANY a young man has found that concern for his employer's interests is one of the most powerful levers for raising himself to a better position.

* * * *

THERE is little distinction between the man who refuses to sell at a fair price and the man who refuses to buy at a fair price—either one can turn business upside down.

WILL MEAN PROSPERITY

THE outstanding event of the week in the financial world has been the arrival of the long-expected time when a policy of contraction and anti-inflation could be inaugurated. What has happened is a result of the action of the Federal Reserve Board of the United States in raising rates of rediscount and of the Bank of England in advancing its rates. The policy thus inaugurated will be followed by other countries because England and the United States are the only two nations in the world to-day in a position to control financial conditions, and especially the rates of return for money. The fact that they are in this position makes the policy they have decided upon of world-wide significance no matter what any other nations may do. During the years of the war and the year that has elapsed since the signing of the Armistice tremendous inflation has occurred throughout the world. Much of this resulted from the activity caused by providing the Governments with what they needed. It was usually a question of getting what was needed and getting it quickly regardless of the price. This produced conditions such as merchants have never before experienced. There is little doubt that the action just taken will mean a new era, and the broad significance of the change portends more or less contraction of credit and hence of purchasing power. The contraction or limitation of prices of commodities necessarily follows. Business has been good but there is little doubt that it will be better because any number of people have been holding off buying except for immediate needs because they felt that sooner or later the conditions that have been prevailing would be checked. The time has arrived and to say that it will be welcomed by business men is to state a fact.

MERCHANTS HELPING THEMSELVES

NO less than 1,600 local tribunals have been established in England with a view of investigating all cases of alleged profiteering. W. McCurdy, M.P., secretary of the Central Committee, recently made some interesting comments on the general situation. "One of the causes of profiteering," he said, "is the fact that the public seems to have lost all sense of what is a reasonable price. To meet this situation, which is really, perhaps, one of the most important phases of the work, the Investigation of Prices Committee is giving the people general information so as to enable them to know what are fair prices. This will help not only the people but the retailers, and I am glad to be able to say that in several of the most important retail trades there is now a movement to assist the Government in every possible way by organizing plans under which the trades themselves will take steps to reduce prices to the public and eliminate all profiteering. The grocers, for instance, are planning to draw up price lists for all articles which are uncontrolled and they expect to be able to make substantial reductions."

PROTECTING THE MARKETS

ANY danger that may have existed in regard to Germany trying to use Canadian or other British colonies as a dumping ground for German goods, has been removed by the appointment of a president of the British Chamber of Commerce in Germany. His

duties will give him complete control of the license department. It is announced that all goods leaving Germany for British ports without license will be confiscated. It would be difficult to imagine a more complete protection of British markets from the Hun.

BUSINESS MEN FIGHT BOLSHEVISM

IT is gratifying to know that the business men of the United States have as a body joined in the fight to rid the country of Bolshevism. Quick, decisive action which resulted in the arrest of several hundred of the most active Reds was one of the first results of the business men's co-operation with the authorities. It is only a matter of a short time when a great many of those who were placed behind the bars will be deported. This work of cleaning up the country is one in which Canada is vitally interested and has also done good work, as the collapse of the Winnipeg walkout shows. It sometimes takes a long time to get the business men away from their stores or factories long enough to act, but once they are aroused to the seriousness of a condition they are usually not long in remedying it. With the clean-up in progress across the line it is likely that the end is in sight of the unprecedented strikes and troubles that have been occurring, and the sooner these things are settled the sooner business will go back to normal conditions.

A CASE FOR STANDARDIZATION

THE need for electrical goods with a standard plug is becoming more apparent every day. This has already been done with electric light bulbs and with the steadily increasing popularity of other lines, there is no reason why the householder should be seriously inconvenienced as at present. There is no justification at all for the housekeeper having to keep a dozen different cords hanging around the house, each with a different plug at one end and very frequently at both ends. One is for the toaster, another for the iron, another for the vacuum cleaner, another for the washing machine and so on. This means real annoyance and inconvenience for many women and is entirely unnecesary if the manufacturers would get together and agree on a standard plug. Incidentally, it would help in increasing the sales of merchandise. In St. Thomas, Ont., a citizen recently had his house wired for electricity and planned to instal all the latest conveniences. He had sockets for irons, etc., and when he endeavored to make use of the appliances, he discovered that the sockets were built for the metallic power conveyors to be inserted horizontally, while the new equipment he was putting in had parallel conveyors. He was forced to remove the sockets and instal new ones. This matter, it is stated, is to be taken up with the Ontario Hydro Commission, as it is not the first complaint of the kind that has been reported. The average citizen is "sold" on electricity and the value of convenience of electrical utilities, but it is little things like this that make endless trouble and often cause people who would buy washers, vacuum cleaners and other things to go slow. The men handling electrical goods can do a great deal if they will get togther and put it up to the manufacturers to standardize.

HELP ALONG THIS WORK

IT is the aim of both the Dominion and Provincial Governments as well as of many of the large manufacturing firms to encourage home owning. This year has seen considerable progress along this line, and while there is still an acute shortage of residences, especially in the larger cities, a good deal has been done to alleviate a condition that was becoming almost intolerable. It is still bad enough. The housing question is occupying almost as prominent a place in the news columns these days as labor unrest or any other big problem. Not only is the scarcity of houses driving many people to own their own homes, but also the exorbitant rents being asked by landlords. Brisk as building has been this year, it will apparently be small compared with the programme that will get under way next spring. All movements to encourage home owning are of keen interest to the plumbing trade and offer splendid opportunities for selling bathroom fixtures, heating equipment or other lines, and also for the installation of these goods. The plumber who is in a position not only to advise those who are building about the best materials to use, but to show them a well-selected stock of electrical fixtures, bathroom equipment and fixtures, electrical washing machines, vacuum cleaners, toasters, irons, and other lines is going to get some nice business. Many plumbers have been making the most of these opportunities and with excellent profit to themselves. While business has been splendid this year, they see even more trade of this kind ahead next season and are making their arrangements for getting their share of it. As was stated by a master plumber in a previous issue of SANITARY ENGINEER, one of the best ways of securing business and of bringing people back to your store, is to be in the position where you can supply their every need in plumbing goods, in other words, carry the stock. This is a sure foundation for any plumber to work upon and those who are conducting their shops on that basis are not worrying about selling the goods. Their trouble very often is to get enough goods to sell. There is every indication that the shortage of goods will not be relieved for some time. Between the American steel strike and conditions prevailing generally, production is not nearly enough to keep up with demands and many manufacturers are having great difficulty in getting raw materials.

REGISTERED TRADE MARK

SUPERIORITY PURITY DURABLE AS THE PYRAMIDS

Port Hope Sanitary Plumbing Ware

Every Fixture is unconditionally guaranteed and bears our label as a protection for you and your customers.

THE "LEIGHTON" LAVATORY

5,400 New Homes in Ontario to be Completed This Year

It is estimated that the above number of houses have been put under way and will be completed this year ready for occupancy.

This is showing a healthy business for the plumber in sanitary installations.

What has been done this year is only a fraction of what will be accomplished next year in house building, so the plumber can look forward for at least another year of thriving business.

It will pay readers of SANITARY ENGINEER to be prepared for the 1920 house-building boom.

The Port Hope Sanitary Catalog is at your service. Yours for the asking.

REGISTERED TRADE MARK

Bath Room—Plate "B"

From Page 6 "For the Home" Catalog

Plate G.1611 —5½-foot "Victor" Bath, with fittings.
F. 112 —22 x 27-inch "Canterbury" Lavatory, with fittings.
F. 91½—"Penzance" Foot Bath on Base, with fittings.
F. 603 —Closet Combination.
F.7335 —26-inch White Enamel Frame Mirror.
F.3624 —24 x 6-inch Shelf and Rail.
F.5191 —Tumbler Holder.
F.5103—Tooth Brush Holder.
F.2102—Nickel Plated Towel Bar.
F.3636—Towel Bar for Bath.
F.4237—Sponge Holder.
F.4057—Soap Holder.
F.4526—Towel Basket.
F.2800—White Chair.

Port Hope Sanitary Mfg. Company, Limited

Factory:
PORT HOPE, ONTARIO
TORONTO SHOW ROOMS
119 King St. East

WINNIPEG OFFICE
405 Tribune Bldg.
HALIFAX OFFICE: McCurdy Building, Hollis Street

Head Office:
ROYAL BANK BUILDING, TORONTO
MONTREAL SHOWROOMS
234 Beaver Hall Hill

News from Here and There

CONTRIBUTIONS OF NEWS GLADLY ACCEPTED

New Firms

C. Hutchinson & Co., plumbers, have been registered at Montreal by Chas. T. Hutchinson, Joshua Gamble and Geo. Philip.

Milton Robinson has opened a plumbing shop at Arnprior, Ont.

George Millward, formerly with the plumbing firm of George Millward & Son, Port Hope, Ont., is starting in business for himself at Port Hope.

Personals

The young son of David Norwich, secretary of the West Ender Club, Toronto, had his arm fractured by falling from a siwng.

Archie Macknin, who, as stated in a previous issue of SANITARY ENGINEER, had his knee badly hurt in a ball game last summer, underwent an operation in Toronto General Hospital last week, and it is now expected that a complete cure will result.

The marriage takes place in Toronto on November 18, of Mr. Lou Palter and Miss Smith.

Trade Notes

Dauphin, Manitoba. — H. H. Moore succeeds F. W. Bumstead, plumber.

S. W. Whetstone, of Edmonton, Alta., has disposed of his plumbing business.

Maulson & Buchanan, 40 King Street E., Toronto, have received the agency for Canada for the sanitary clay products, sanitary fixtures, etc., manufactured by George Howson & Son, of Hanby, England.

W. A. Bradford & Co., plumbers, has been registered at Montreal (West) by Gilbert S. Bradford.

TENDERS

Plans are completed and work will be commenced shortly on a new club house at Regina for the Imperial Oil Company. The building will cost $20,000, and shower baths and complete plumbing and heating will be installed.

The London, Ont., Housing Commission, S. Baker, secretary, plans the erection of thirty more dwellings and wants prices on all plumbing and heating goods.

J. C. Wanless & Co., Chatham, Ont., have plans for a new hardware store, three storeys and basement, 26x145. Steam heating. Construction will commence as early as possible in the spring.

Plumbers' License Fee May Be Set At $25

The proposed Plumbers' License By-law, which will come before the council at London, Ont., shortly, is expected to make provision for the protection of local plumbers and also look to the increasing of the efficiency of the trade by imposing strict theoretical and practical examinations on future applicants. The by-law, which may be framed along the lines of similar by-laws now in force in various municipalities, will provide an easy examination for those who are already engaged in plumbing work in the city, and special consideration will possibly be shown men who have spent years in the trade.

Chairman Saunders, of the Board of Health, said that there were many who could do a certain job, but they were unable to tell how it was done. He hoped that discretion would be shown and that the quality of work turned out would be the highest criterion of a man's ability. The by-law. it was explained, would operate at first against plumbers working in the city but living elsewhere. They would have to pay a license fee, and in the case of master plumbers would have to have a "regular place of business in the city."

Plumbing Inspector Young stated that the license fee for master plumbers would probably be $25 and for journeymen plumbers $5.

Some difficulty might be experienced in the first two or three years in getting the law efficiently and wisely administered. but the lengthening period of time would see conformity to recognized standards and general satisfaction.

Plans for a new general hospital at Brandon, Man., are being prepared. R. Darrach is chairman of the building committee.

Work is to be commenced as soon as posible or a large number of new residences at Kitchener, Ont., for the Housing Company. Ald. George J. Lippert is a director of the company. Prices are wanted on plumbing and heating goods.

Tenders are open for a new school at Windsor, Ont., 21 rooms, to cost $400,000.

Work will commence shortly at Charlottetown, P.E.I., on a new country club house, 65x90, two storeys. E. S. Blanchard has plans.

D. L. Shafer, of St. Thomas, Ont., has commenced excavating at Windsor, Ont., for two dwellings, to cost $8,000. Interested in prices of plumbing and heating goods.

Work on a new barracks, 30x70, two storeys, for the Salvation Army at Melfort, Sask. Work will be commenced at once. Plumbing and heating to be let.

A vote of the ratepayers to provide for the installation of a water system in Scarboro Tp., Ont., will be taken on January 1.

The Gold Medal Manufacturing Co. of Uxbridge, Ont., is calling for tenders for all work in connection with the erection of five new dwellings.

T. L. Church, City Hall, Toronto, will receive tenders until November 20 for plumbing and heating, electric wiring and fixtures for new office building and stables.

Incorporations

The Hoover Suction Sweeper Company of Canada, Limited, capital $1,000,000, head office Hamilton, Ont., plans to manufacture and deal in suction sweepers.

Porrits & Spencer (Canada) Limited, capital $1,000,000, head office Hamilton, Ont., plans to manufacture and deal in flax, hemp and jute products.

Dominion Gas Saver, Limited, head office Sherbrooke, Quebec, capital $40,000, plans to manufacture and deal in gas stove equipment.

900 HOUSES NEEDED IN GUELPH

James Govan, provincial architect for the Ontario Housing Commission; J. W. Siddall, his assistant, and R. Hall, town planner, were in Guelph last week inspecting the houses now being erected by the Guelph Housing Commission, and also to get first-hand information regarding the need for building five hundred homes here in 1920. It was announced that in the event of these houses being gone on with, J. Siddall would come here and devote his whole time and attention to the proper erection of the houses. The Government officials intimated that there would be no difficulty in securing the necessary money. It is believed that 900 houses will be required in Guelph by next year, and if this number were erected the cost would be in the neighborhood of $3,000,000.

AWARDED $70,000 CONTRACT

Bennett & Wright, of Toronto, have been awarded the plumbing contract at $70,000 for the new Western University Medical School at London, Ont.

INSPECTION AT PETERBORO

Plumbing Inspector Meadows, of Toronto, was in Peterboro', Ont., last week, making an inspection of the city's plumbing work. The inspection is the outcome of allegations that plumbing work in Peterboro in many cases did not measure up to the standard of that in other cities.

Mr. Meadows was given a copy of the city's plumbing by-laws, and will report what work, if any, is in contravention of that measure, and also any which, while within the requirements of the by-law is, in his opinion, not up to the generally accepted standard.

MUST APPOINT INSPECTOR

Cobalt.—Sanitary Inspector Johnston is leaving Cobalt for Toronto at the end of the month, and certain members of the town council thought that, in the interests of economy, the job could be united with that of Chief of Police, Councillor Gaudreault, fathering a motion to this effect. The Board of Health, however, has objected to any such policy, Dr. Lidell, the Medical Officer of Health, declared it would be false economy. The board has recommended to the council that a successor to Mr. Johnston be appointed, and this was agreed to by members of the council.

BRICKS CLOGGED SEWER

A press report from St. John, N.B., says:

"Recent troubles with the plumbing in the King George School have brought to mind some interesting episodes in the past history of the building. A short time ago it was found that the sewer pipes in the school were badly clogged, and on investigation it was discovered that the clogging was due to bricks which had been forced into the pipes and became jammed. To remedy the trouble it was necessary to go to some expense in breaking up the concrete floor to get to the pipes and remove the bricks."

CONTRACTS AWARDED

Ecclestone & Bates, Ltd., sanitary engineers, Bracebridge, Ont., have been awarded the contract for twenty-two private bathrooms in the south wing of the Beaumaris Hotel at Lake Muskoka, which is being remodelled. Mr. S. Bates is looking after the plumbing and gas.

APPOINTED INSPECTOR

Alfred J. Bolus, of Weyburn, Sask., has been appointed Sanitary Inspector by the Board of Health at Fort William, Ont.

CATALOGUES AND BOOKLETS

The United Brass Founder and Engineers, Ltd., Woodchester, Eng., have sent out a number of additions and revisions for their catalogue as follows: Label gummed ready for pasting on front of catalogue; emergency index leaflet for insertion in front of catalogue after our specialty page; reprinted conditions of sale page; set of pages which have been revised and reprinted of Section P.

Ontario Executive to Visit Master Plumbers at Galt and Kitchener

A VISIT to Galt and Kitchener will be made on November 27 by the members of the executive of the Ontario Society of Domestic Sanitary and Heating Engineers.

In the afternoon a meeting will be held at Galt, when matters of interest to the men in the trade will be taken up and organization discussed.

The evening meeting will be held at Kitchener, and master plumbers from both Kitchener and Waterloo will be in attendance. It is also expected that visitors from Preston and Hespeler will attend the afternoon session.

Addresses on the work that is being done will be given by President T. J. Minnes of Brantford, Vice-President George Grinyer of Guelph, and Secretary Garrett Frankland, of Toronto.

Will Meet at Oakville on November 26

Ontario Executive to Discuss Trade Matters With Master Plumbers on the Toronto-Hamilton Highway

A MEETING of the executive committee of the Ontario Society of Domestic Sanitary and Heating Engineers, with the men in the trade along the highway between Toronto and Hamilton, has been arranged for the evening of November 26.

Matters in connection with organization work will be discussed and addresses will be given by President Thomas J. Minnes, of Brantford; Treasurer Thomas R. Maxwell, of Toronto; John Wright, of Toronto; C. G. Stewart, of Hamilton; J. H. Doherty, of Mimico, and Secretary Garrett F. Frankland, of Toronto.

Toronto "Ender" Clubs Hope to Have Fine New Club Rooms Before Very Long

THE "Ender" clubs of Toronto are now in full swing for the fall and winter season, and very satisfactory meetings are being held. The "Ender" clubs are considering purchasing a home of their own, and hearty support was offered the project by all present at a meeting of the East Enders on Tuesday. There was an open discussion along the lines of financing the proposed new home, which, according to figures submitted, will pay a good dividend besides affording the members more comfortable and larger quarters. It was proposed that the new club house would be an ideal location for business offices of those who are directly interested in the sanitary and heating trades and also that suitable show rooms could be equipped, all having a tendency to increase trade.

The new club house, it is expected, would prove a great asset to the clubs which have accomplished so much, especially of late. Some members did not hesitate to state that even for the short time they had been in touch with the clubs they had figures to show increased results of uniform prices and fair profits.

The West Enders' club is in the running also and for the new club house already has a longing eye on the silver cup, that is to go to the "Ender" club showing the most new members at the close of the campaign. The discussions chiefly were the new club.

W. H. Daw gave a very interesting as well as practical demonstration with figures of the most profitable way to handle a 6½ in. piece job. The address was much appreciated by all present.

HOUSES PUT IN SANITARY CONDITIONS

Continued from page 18

after they have been forced to clean up. Tenants living in condemned houses should get a rebate in rent for the time that the house was unsanitary."

Later in the day the agent of the C.N.R. called upon Dr. Roberts. He declared that the decision to clean up the houses, get a more desirable class of tenants (he blamed the tenants for the conditions of the buildings) and charge higher rentals was reached before the Board of Health condemned the houses.

Dr. Roberts stated that the clean-up order was not the result of a complaint to the Board, but followed a routine inspection.

"Complaints from tenants of C.N.R. houses in the north-end that rents had been raised to exorbitant rates have been received by Controller Halford, who appeared in the city hall armed with a schedule showing that the increased rentals were $10 to $15, $12 to $18, and $22 to $40, the assessment on one of the last class of houses being only $1,700. The controller termed it an outrage inasmuch as some of the houses are practically bare of any conveniences or fixings."

Says Skilled Sanitarians Vital to Health of Community

Dr. Aykroyd, of Kingston, Makes Interesting Comment on Work of Sanitary Engineers in Pointing Out Dangers of Polluted Civic Water Supply

DR. S. A. AYKROYD, of Kingston, Ont., has written to the press of that city a strong letter in which he points out the serious dangers citizens face by delaying action in getting a more pure supply of drinking water.

Dr. Aykroyd says in part:

"One of the problems confronting a great many cities is a pure water supply. We have that problem in Kingston, and the question is how are we going to solve it? What is the best solution? Everybody knows Kingston's water is polluted, and what we are doing to make this water at all safe to use is only a temporary expedient.

A Big Problem

"Will the time ever come when all the cities and towns on the great lakes and rivers between Canadian and the United States stop emptying their sewage into these waters? Until the Governments of the two countries prohibit this practice these waters are barred as a source of pure water supply. Even if this were done these waters would still be subject to contamination, by the ever-increasing lake, river and canal traffic, unless the boats, too, were strictly prohibited from dumping their sewage into the water.

Says It Is Disgrace

"It is a disgrace to our modern civilization, with all our knowledge of sanitary science, that these greatest and purest of natural waters on the face of the globe are made the receptacles of millions of cesspools. It ought to be stopped, but it is not likely to be for many years yet. The cost would be great, and there would have to be international agreements; besides, there is always the tendency among many to allow matters to continue as they are or as they have been in the past, and a decided objection by others to incurring additional expense for what may seem to them only aesthetic reasons; but, no matter what may be the cost of providing a reasonable supply of pure water for a city's personal domestic uses, a very little consideration will show that such expenditure is true economy from solely a financial point of view, even though we ignore the misery and sorrow of sickness and deaths that are due to the use of a polluted water.

Infectious Disease

"A polluted water may carry the organisms of infectious diseases, or it may produce or favor the development of diseases which are not due to specific germs. In addition to this, and of at least equal importance from a sanitary point of view, is the depressed state of the system that the habitual use of impure drinking water causes, and the predisposition to disease that ensues. By the power of accommodation and through long habit, a community may become so 'protected' (?) against an impure water as to manifest no striking symptoms, while strangers may be seriously affected by it; but even in such cases the condition of those habitually using the water yill probably be more or less depressed and far from good.

A Fool's Paradise

"If we apply the above quotation, from an authority on the subject, to the situation in Kingston, we may see in what a fool's paradise we are living. The lowering of the vitality and reduced resistance to disease caused by impure water, cannot be emphasized too strongly. Suppose an epidemic like 'flu' comes along and finds a depressed state of the system, due perhaps to drinking impure water, are we not more liable to attack and to succumb to the disease? In fact diseases of so many kinds are so largely a question of sanitation we should have skilled sanitarians in every community, independent of the medical profession, whose function is to treat disease when it occurs rather than to prevent it; while the sanitarians would seek exclusively to prevent disease.

Prevention is Best

"It is an old saying that 'an ounce of prevention is worth a pound of cure.' Then one sanitarian should be worth as much to the community as twelve doctors, drug measure. I don't mean to say by this statement that the doctor is not a very useful member of society, but I do mean to say that less doctors would be required, and the profession could be more highly specialized if our sanitary conditions were improved.

Health Improves

"The health of a community always improves when an abundant and pure water supply is given. You will excuse me, Mr. Editor, if I am dwelling at some length on this question. I do not wish to ring the changes on reconstruction and the new era now dawning upon the world, but it would be hard to find a more important subject for consideration at the present time than that of obtaining the purest possible water supply for the people. We are abolishing 'booze,' and I am in favor of doing that, but what are we giving the people to drink in its place, chemically treated sewage water? Why, that is not better than 'two per cent.' We should at least give them the purest of 'Adam's ale' distilled in nature's great laboratory, unadulterated by man."

Says Board of Commerce Efforts Unsettle the Public and Disturb Business

THAT the efforts of the Board of Commerce to find a solution of the high cost of living are not only failing of their purpose, but are unsettling the public mind and disturbing the manufacturing and industrial world, is the opinion of Mr. Henry Watters, treasurer of the Dominion Board of the Retail Merchants' Association of Canada. In an issued statement, Mr. Watters strongly resents any imputation that retail merchants are "profiteering"; and as a proof of it he calls attention to the fact that competition amongst the retailers is so keen that big profits are impossible, and that a survey of Canadian retailers will show that exceedingly few of them belong to the millionaire class.

Not only is the board failing to obtain the desired result, says Mr. Watters, but "we are further of the opinion that instead of ascertaining the real cause of the increased cost of living, the agitation has unsettled the public mind and disturbed the manufacturing, as well as the producing and distributing industries."

The treasurer follows with some ten suggestions to the board, which, in brief, are as follows:

First, that consideration should first be given to basic principles of manufacture, production and distribution and costs involved in same.

Second, that increase in profits, if any, may be ascertained.

Third, increase in wages, freight and other charges.

Fourth, foreign demand for articles.

Fifth, effect of war profits and income war tax on cost of raw material and manufactured articles.

Sixth, increase in orders and profits by jobbers and wholesalers, on what lines, and bearing in mind increased cost of production.

Necessary Overhead

Seventh, necessary overhead charges to properly conduct retail trade.

Eighth, submission to the board of all forms of contract fixing prices by manufacturer to wholesale, retail and buying public.

Ninth, that yearly turnover of every class of merchandise should be the basis of computation of financial returns, not an investigation into one special article.

Tenth, that all possible assistance will be given by the association to the board in their investigation.

Added to this is a statement by Mr. E. M. Trowern, secretary of the Dominion Executive of the Retail Merchants, in which he states that the retailers no longer want to be branded as thieves and scoundrels. He contended that there was no use in continuing to fool the public with regard to the high cost of living; prices would only come down in the natural order. Ninety per cent. of the people, he held, do not know what they were talking about when they ask for arbitrary reduction of prices.

Ventilating the Modern School

Fifteenth Article of Series Written Especially for "Sanitary Engineer" by N. A. Kearns—First Article of the Series Appeared in April 1 Issue

IN many of the smaller towns of America it is still the custom to heat and ventilate the school buildings by means of the warm air furnace.

The drawings here shown illustrate in one case, a system of direct extraction of the foul air, and in the other, the indirect system.

The plans first referred to are those used in the building of a school at Wynyard, Sask., when indirect extraction of the foul air is the principle of the system as installed.

Two Class Rooms

The building contains two class rooms; and an assembly hall, that may be converted into class rooms when such are required. Ultimately four class rooms will be built on the other side of the tower, thus making the building symmetrical in outline.

The floor plans are not shown, as the location of the ducts on the basement plan and in the sections indicates clearly enough when the discharge and exhaust faces are set at positions remote from the outer walls.

It is sometimes the practice to place the exhaust openings under the windows, conveying the foul air across to the vent stock by way of ducts set between the joists. There is no advantage in so doing unless the room is very large, say, 34 feet in its narrowest dimension.

Where Fresh Air Enters

Drawing No. 1 shows the rear elevation of the school and indicates where the fresh, cold air enters the building at the grade line. A grass plot lies in front of the opening, so there is little danger of dust entering with the air. The wood louvers shown prevent rain or snow passing into the cold air chamber. The louvers are backed with ⅜-in. bird-proof screens.

The foul air exhaust is shown at the top of the stock, and it is also provided with weather-proof louvers and bird netting.

Fresh Air Intake

Drawing No. 2 is a section showing the fresh air intake; the heater chambers, a fresh air flue, a return air flue, and the direct and by-pass openings of the chamber and of the flues.

The heater chamber is built with brick walls and roof. There is a brick dividing partition between the heaters.

The base of every warm air flue opens to the cold air chamber, so that air may enter without passing over the heater when a class room becomes too dampers, shown on drawings No. 2 and No. 3

Equalizing Damper

In addition to the mixing dampers, each warm air flue has an equalizing damper that can be set to counteract the effects of outer wind currents.

The return air flues are built as ordinary stud partitions, over the air return passages in the basement.

Drawing No. 3 shows a heater chamber in cross section, a foul air return flue, and a fresh air flue, with its by-pass, its mixing and equalizing dampers, complete with their controlling handles and cables. This drawing also shows part of the main vent shaft and a chimney of tile pipe.

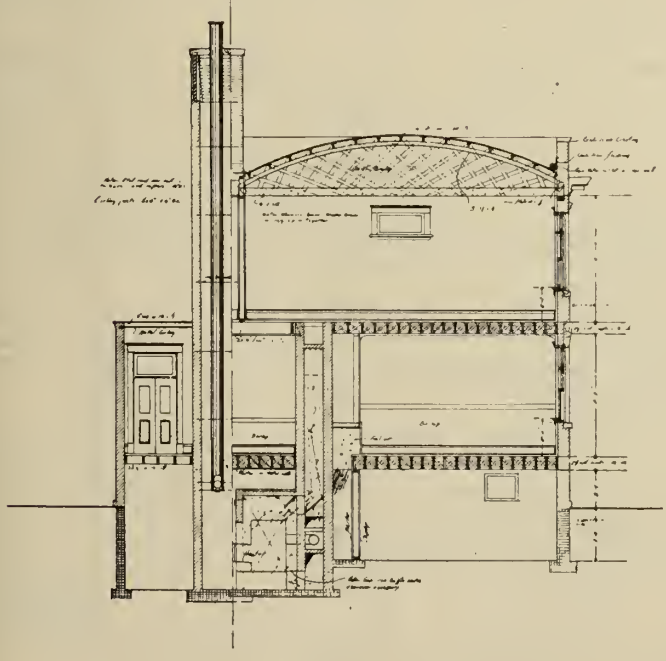
Basement Plan

Drawing No. 4 is the plan of the basement. The warm air furnaces are set close to all of the flues.

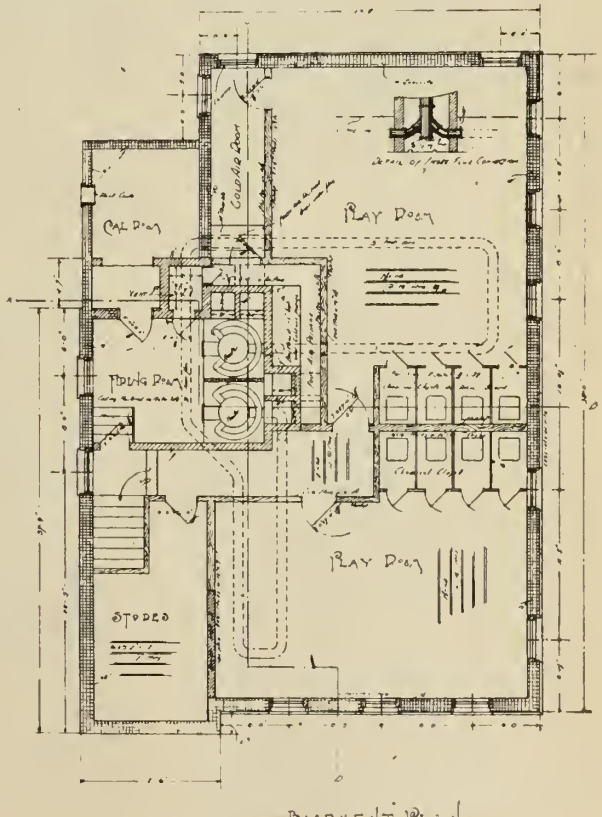
The flues connecting to faces on the ground floor are 24 in. wide and 20 in. deep. The flues leading to and from the first floor are 21 in. wide and 20 in. deep.

Referring to the plan, we note that the foul air return passage lies directly across the path of the incoming cold air. Reference to drawing No. 2 will show how the cold air passage drops at this point to avoid the interception. A door may be observed set in the wall between the cold air room and the foul air passage; the reason for this door will appear later on when we describe how the system is operated.

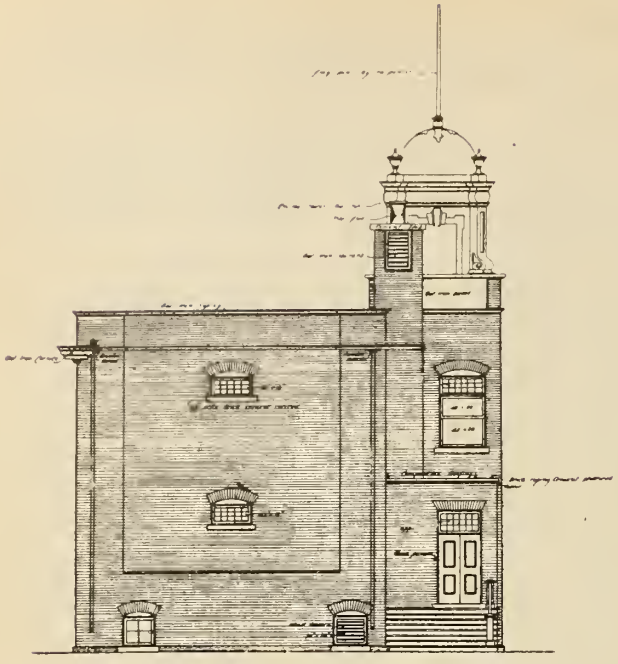
The main vent shaft is 3 ft. 0 in. wide and 4 ft. 0 in. deep, and contains a tile smoke flue, as shown on the plan and cross section. The door in the vent shaft wall, on the firing room side, is simply for the purpose of access to the air passages and is a thing apart from the ventilating system. The door, marked 1 ft. 6 in. x 6 ft. 0 in. serves as a controlling damper on the foul air escape.



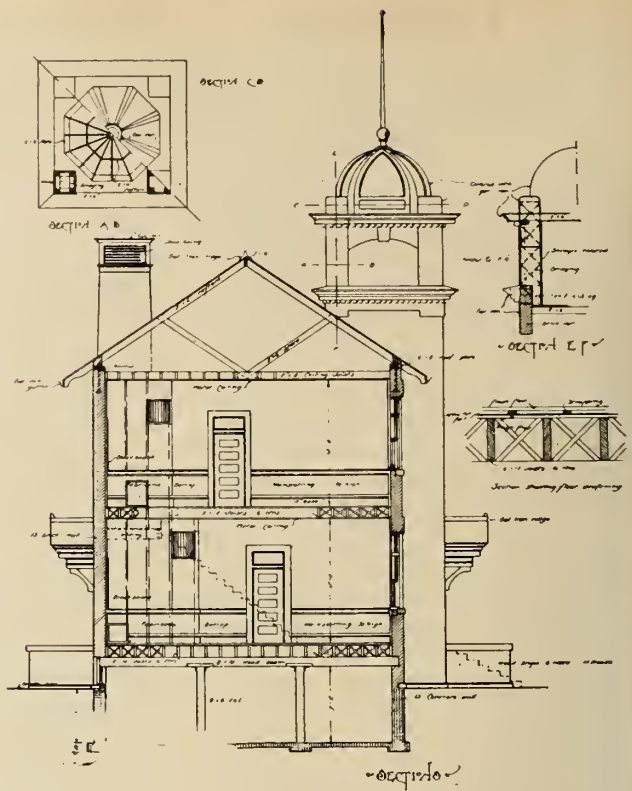
Cross Section.



Basement Plan.



Rear Elevation.



Section.

Operation of the System

Fresh, cold air enters the cold air room and passes to the heater chamber by way of the openings set at the floor line of the chamber. The cold air is here heated to the temperature required, and is then driven into the class rooms by the weight of cold out-door air. At a height of 7 ft. 0 in. from the class room floor lines, the air is driven from the ducts through galvanized iron diffusing faces. The warm air travels across the room close to the ceiling, drops to the floor along the outer walls, and then back to the foul air openings, placed close to the warm air flues, and at the floor line. In this way there is a complete circulation of air in the room.

Foul Air Passage

The foul air passage in the basement connects to an opening in the main vent shaft. This opening is covered by a door built in three sections. The object of constructing the door in this way is to provide a means for regulating the area of the vent opening.

At the top of the main vent shaft there is provided a system of automatic check dampers that close on the windward side of the flues during the time of brisk winds. At such a time the dampers on the lee side of the shaft are wide open; so it then becomes necessary to throttle the vent shaft at its base to offset the powerful pulling effect of the naturally induced vacuum.

When Heating Only

Before the pupils assemble in the class rooms, and at other times when the ventilating system is not required, the damper-door is closed and then the door between the foul air passage and the cold air room is opened. The cold air entries, in the walls of the cold air chamber, are closed. The air returning from the class rooms passes out of the foul air passage to the cold air room, and thence back to the heater chamber.

When using the apparatus as a heating system, the air is warmed to a much higher temperature than during the time of ventilation. With the higher temperature there is naturally a higher draft obtained in the flues, and sufficient to make up for the lack of temperature head existing when the main shaft and fresh air intakes are open.

The Smoke Pipes

The smoke pipes are run in circuits in the basement to heat that part of the building. In warm air systems there is often a great deal of heat lost by way of the smoke flue; so in this instance it was deemed advisable to run the smoke pipes just as in many other schools heated by warm air: in the long circuits.

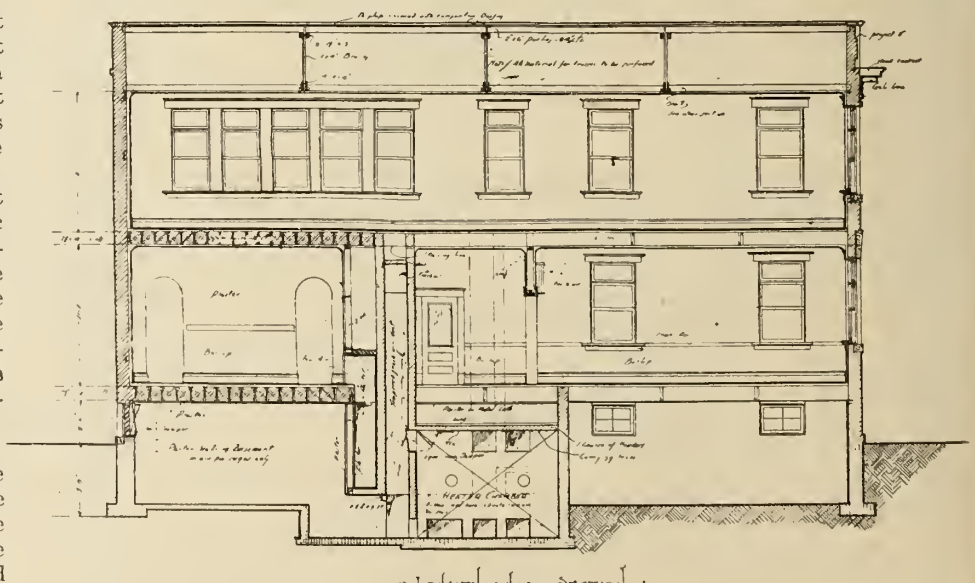
Such a long run of pipe would not be advisable when combination warm air and steam, or steam or water systems were to be used.

Direct Extraction Systems

Drawings Nos. 5 and 6 show a system used for the direct extraction of foul air.

This system differs with that already described in the paths taken by the foul air in escaping.

The cold air enters the heater cham-



Longitudinal Section.

ber; is heated, and discharged into the class room, much as in the previously described system.

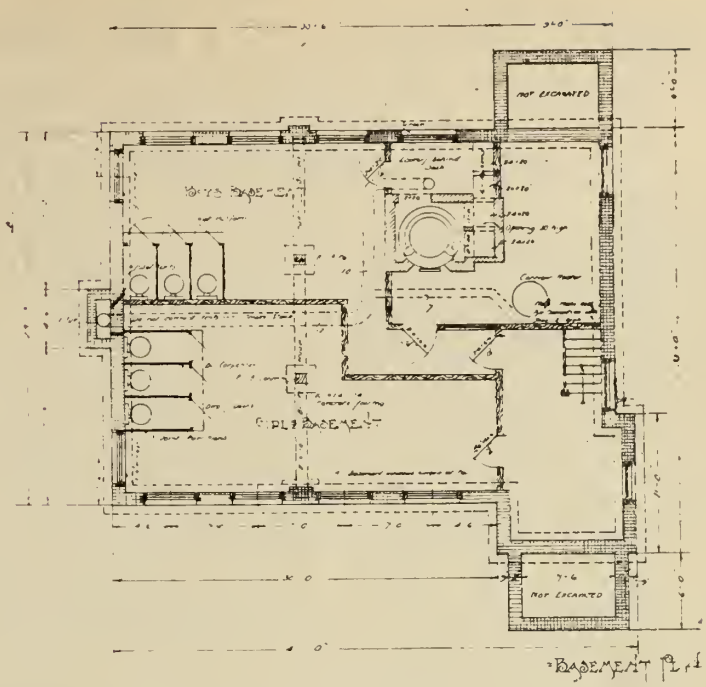
There is no main vent shaft provided. The foul air is discharged straight up to the outlet above the roof, as it is shown on the cross section, drawing No. 6.

A Return Duct

Immediately behind the foul air opening in each class room there is a damper that may be set to convert the vent flue into a return duct. When these alternating dampers are adjusted to close the outer passages, and to open the way of return, the cold air intake in the basement is closed. Then the ventilating system is no longer in operation and the plant becomes simply a heating apparatus.

In Saskatchewan Buildings

These heating and ventilating systems were installed in schools, set amid the unvaried plains of Central Saskatchewan. The rigors of the climate there call for installations of heating and ventilating systems that surely set a gauge for the easier problems coming in warmer lands.



THE QUESTION BOX

(Continued from page 35)

Say, Mr. Plumbing Editor, I sometimes get a chance to see your paper, and I was just wondering if you could tell me something. It is something I hear them talking about in the shop sometimes; the different classes of fittings, A, B, and C.

What does it all mean?

Is A class all up to and including ½-inch or all up to 1-inch, or what?

Does B class mean galvanized, or what?

I wouldn't bother you about this, but I can't get anybody in the shop to tell me. I asked the boss the other day, and he said he guessed it meant the different qualities.

And say, here's another thing I'd like to know. Why don't the brass companies put the official number on the boxes that have the goods in instead of their own number. I got the devil the other day for making a mistake on account of this mix up. These makers could just as well all put the official number on the boxes. Perhaps you know a good reason why they don't. I'll call and see you some time when I get my trade learned and I save enough money to go to Toronto Fair. Good-bye.

TINY TIM.

Will Send Full Details

Replying to the query of "Tiny Tim" with regard to the different classes of fittings: It would require a good deal of technical explanation to give a complete answer to this question. Fittings, Limited, of Oshawa, have placed upon the market a catalogue dealing with the several classes of fittings. Roughly speaking, "A" class consists of one-eighth inch fittings; "B" class of one-quarter, three-eighths, and one-half; and "C" class one-half up to two and one-half inch. At the same time it will be found that similar sizes of elbows are to be found in different classes of elbow. The class does not refer to galvanized, as the questioner suggests; all these classes are to be had in galvanized and black.

We would suggest that "Tiny Tim" communicate with us and we will be glad to provide him with the catalogue above referred to.

With regard to the question concerning the reason why brass companies do not put the official number on the boxes containing the goods, one wholesaler explained to SANITARY ENGINEER that it was, more or less, a matter of advertising.

"That is done," said our informant, "so that in case they want a certain fixed bibb, they will look up the number and be able to find out who makes it."

We trust these explanations will be satisfactory to "Tiny Tim" and that he may be able to call on us before the next Toronto Fair.

Editor, SANITARY ENGINEER,

Dear Editor,—Could you give the necessary information on the following: A friend of mine had a wood furnace in his house and had a new coal furnace put in, but since that has been done wet soot soaks through the brick and runs down the chimney. He claims that all the while he was burning the old wood furnace they never saw anything of such soot. Could you give me a remedy for same, and oblige?

AN INTERESTED READER.

Answer.—The heavy oily liquid that is running down the inside of the chimney is probably condensed hydrocarbon vapors, and the way to cure this trouble is to prevent condensation in the flue.

The condensation in the flue is due to a downward circulation of cold air within part of the flue, or by the cooling surface of the walls of the flue.

First look to the chimney and see if it is not much larger than the smoke collar on the furnace. If it is you should reduce its area at the top to the size of the smoke pipe, and in reducing it, be sure that the reduction is not made too abruptly. The reduction should be made with a pitch of not less than 60 degrees with the horizontal.

But perhaps the flue is shallow, but too wide. In that case build a new flue. There is another thing that may cause a downward movement of cold air within the flue: The too tight checking of the air supply to the fire. Don't check the air supply too much; use the open check damper on the pipe, and see that there is a plentiful supply of air to furnace room.

Examine the teeth of the grate to see if they are not plugged up with core sand.

The whole secret of preventing condensation in a chimney is to prevent air from travelling downward within the flue.

MARKET CONDITIONS

(Continued from page 38)

factorily overcome, to adjust the great difference existing between the different moneys. Nearly all ingots, however, are showing a strong tendency to to advance and are firming towards that end.

COPPER remains unchanged with a strong tendency showing towards advance Not much is offering, however, and the market is rather quiet. The present quotations are from a basis of 25 to 26 cents per pound.

SPELTER is quoting half a cent higher, with a slight demand offering. The tendency though is firm and unsettled. Quotations are now 10½ cents per pound.

Says Meters Will Effect Big Saving

W. H. Randall Tells of the Huge Waste of Water and How to Stop It—Practical Discussion at North-Ender Club Meeting in Toronto

Written for Sanitary Engineer by E. D. HEITT

MEMBERS of the North-enders' Educational Club of the Domestic Sanitary and Heating Engineers of Toronto listened to a most interesting and instructive address on "Water Meters" by W. H. Randall, for many years connected with the Waterworks Department at the Toronto City Hall, at their regular meeting on Thursday evening. Mr. Randall's entire address was a refutation of the plea that "water should be made as free as air"; and in the course of his remarks he showed the vast waste of water that was going on in many of the cities of Canada and the United States because it was not properly metered. That a tremendous saving could be effected to the householders of Toronto and to the city as a corporation by the installation of meters was the claim of Mr. Randall. The members of the club present took a very serious view of the situation and it was suggested by the president of the club, Roy E. Belyea, that the plumbers put a candidate in the field for municipal honors to run on the ticket of water conservation and the installation of meters.

The Meter Question

After expressing his pleasure at being present to address the plumbers on this important matter, Mr. Randall proceeded:—

"The general meter question has been before the public in the United States for many years, but in Canada it is only starting to become a live subject. You, sir, and gentlemen, being so closely connected with water distribution must have found that something in the way of a check must be done to offset the waste, due largely to the carelessness of the public, who, in many cases, allow their plumbing to become defective, and in others, allow the water to run waste down the sewer instead of the valve or tap being closed after each operation. This, as you know, is a common practice in garages and other places where they have cement floors drained to the sewer. The washer drops the hose on the floor and lets it run until he is ready to use it again. Thousands of gallons of water are allowed to go to waste daily in this manner.

Another Feature

"Then another important feature has arisen which practically makes it a compulsory for every city to consider the selling of water by meter to-day, viz., filtration plants, which have become a necessity in practically all parts of Canada, so that the pumping and filtering of water, with the cost of labor and the price of coal, is a very expensive proposition for any city; and to allow people to use water indiscriminately without any restriction will be, in the very near future, a thing of the past.

"One would, at once, ask the question, Why should a man pay for electricity by meter, or gas by meter, and he allowed to take water just as he saw fit at a rate based upon the number of rooms in the house? I think none of you would agree to start a private water company on any such basis as that. I have with me to-night some statistics showing the amount of water per capita used in many of the cities in England, Ireland and Scotland; also a statement showing water used in some of the cities of the United States."

Mr. Randall showed a table of figures and commenting upon them said that European cities used about 50 gallons, on the average, while the City of Toronto, for instance, used 128 gallons during the year 1918.

Results of Waste

Continuing Mr. Randall said: "You will notice in the statistics of the United States that Buffalo showed 310 gallons per capita, while New Orleans showed only 54. While we admit that there may be circumstances why one city would vary more or less in its per capita consumption, this should only be a matter of a few gallons. Buffalo, however, used about five times as much as New Orleans. This, surely, must be due to waste along the lines which I have already mentioned. The London Metropolitan Board, after an investigation, showed that 40 gallons per capita was enough for all sanitary purposes, yet it was found that only 34 gallons were actually used.

"Scarcely any one doubts the strong tendency of water meters, as of gas and electric meters, to prevent waste and leakage and secure careful use. How far meters will accomplish this requires very careful and exhaustive study.

"In the United States, according to the census figures, every million gallons of supply of water allowed to run to waste through leaking underground piping and bad plumbing cost a city for operation and interest charges $65.00 a day, or about $23,000 a year. With our high tax rate and the rapid increase in the cost of living, the financial advantages of checking leakage and other waste of water can hardly be exaggerated.

Business Properties

"The metering of business properties is agreed to by all. It will surprise most people, however, to know that the average house owner, as well as the city, gains by the installation of a water meter and every tenement house owner in this city would gain by having a meter installed.

"Take for example an eight-roomed house under the present system of rating in Toronto:

8 rooms at 65 cents	$5.20
Basin or tap in sink	1.25
One bath	1.25
Closet	2.00
Hose	1.00
Pair of laundry tubs	1.25
Total	$11.95

"With four persons in the house and taking a maximum use of 40 gallons per head through the meter, it would figure for the 12 months, 28,000 gallons. This at 13 cents net would only amount to $3.74 2-5 per year by meter, while the flat rate shows $11.95.

Save the Difference

"The minimum rate in the city, however, for meter rent is $2.00 per quarter, which would mean $8.00 per year; so that a person with a meter on an eight-roomed house would at least save the difference between $11.95 and $8.00, or $3.95, providing his plumbing and everything else was kept in proper condition. From this you will see that anyone with a house of eight rooms up would be better off by having a meter and would, in a few years, even if he had to buy the meter himself pay for same.

"My opinion on this question could be best given as follows:

First—That the water supply should be metered.

Second—That the meters should be purchased and installed by the city at its expense and not by the property owners as at present.

Third—That the city make all repairs to the meters at the city's expense.

Fourth—Installation spread over five or six years.

Fifth—A minimum rate should be fixed."

Would Cost $2,000,000

Following his address, several of the members of the club asked questions of Mr. Randall. The opinion was expressed by the speaker that it would take about $2,000,000 to instal meters in Toronto, spread over a period of five or six years, which would not equal the cost of a new filtration and pumping plant. He believed that the Commissioner of Works would soon be faced with the problem of providing either a new filtration and pumping plant or installing meters throughout the city. He looked forward to the day when the whole Waterworks Department would be run by a commis-

sion as the Hydro-Electric scheme was, because that would be the only revenue-producing form of government.

Overcoming Difficulties

Referring to the manufacture of meters in which he is engaged, Mr. Randall stated that they had had additional difficulties to overcome because of the strike of the metal workers in Toronto, but he believed this would soon be overcome. They were obliged to import many meters from the United States and pay a big duty on them; but they had finally succeeded in manufacturing a meter. This meter was shown to the members of the club, who evinced a great deal of interest in it.

President Belyea, in giving a report of the Conference Board, stated that they had recommended that all plumbers use the contract form for their work. Confusion was caused by only a few of them using it and the Board strongly advised that it be generally used amongst all plumbers.

It was also reported that the Conference Board was sending out feelers to the different associations to obtain their opinion regarding a new club house for all the Toronto clubs. The matter was discussed for a few minutes by the North-enders and their feeling was that the time was a little premature for the outlay of so large an amount as would be necessary to obtain this house.

The thanks of the meeting to Mr. Randall for his address was expressed by the president and secretary, Mr. Frankland.

COMMERCIAL TRAVELLERS' ASSOCIATION OF CANADA NOMINATE REPRESENTATIVE

The general meeting of the Commercial Travellers' Association of Canada was held in St. George's Hall, Toronto, on Saturday last. C. J. Tuthill, president, was in the chair, and in his opening remarks congratulated the members on the continued prosperity of the association, the year closing having been, he said, the most prosperous in its history, notwithstanding that the association had contributed over $75,000 during the five years of war to the various funds called for by the Government and had also invested $400,000 on Victory bonds, making the assets of the permanent reserve over one and a half million dollars invested in gilt-edged securities.

The following nominations were made for the Board of Management for the incoming year:

Toronto Board—C. J. Tuthill, president; Walter Moore, first vice-president; J. H. Dodgson, second vice-president, and E. Fielding, treasurer.

Directors for Toronto Board—C. A. E. Colwell, Jas. G. Cane, John Cormack, John W. Charles, John Curtis, F. W. S. Davis, John Everett, R. G. Hector, M. Matthews, B. E. Miller, C. E. Prime, J. Angus Taylor, Geo. L. Willmot, Geo. G. York and F. J. Zammers.

For the Hamilton Board the following nominations were received of which nine are to be elected: C. C. Smye, first vice-president, and Geo. A. Matheson, second vice-president; directors for Hamilton Board—E. J. Fenwick, David Fraser, R. T. Hunter, M. P. Malone, D. C. McKeon, C. P. Rason, John Stoneman, P. A. Sommerville and H. G. Wright.

The following boards were all elected by acclamation: Kitchener Board, W. J. Moody and F. S. Urstadt; Kingston Board, W. H. Graham and J. E. Singleton; Guelph Board, Adam Taylor, vice-president, and T. H. Gommell, director; Brantford Board, J. H. Hamilton, D. J. Waterous; Montreal Board, W. Williamson; Winnipeg Board, A. C. Merrett, vice-president, and A. E. Rowland, director; Vancouver Board, F. W. Sterling, Robt. Stewart; Ottawa, Board, J. H. Laurie; Brockville Board, F. L. De Wolfe; Peterboro' Board, W. J. Hopwood.

The scrutineers of the ballot are H. C. Clearihue, John H. Kenney and Walter Madill.

The result of the ballot will be declared at the annual meeting in St. George's Hall, Saturday, December 27th.

Expects Little Change In Prices of Stoves

Discussing with SANITARY ENGINEER the outlook in the stove trade, Col. W. M. Gartshore, of the McClary Mfg., Co., London, Ont., stated that business has been excellent, especially in the West. Unless there are developments due to scarcity of raw materials or labor disturbances, he does not look for any change in prices.

The McClary Mfg. Co. will commence the erection of a $100,000 addition to its foundry in the course of a few days. Work is now in progress on a five-storey warehouse that will cost $50,000.

Col. Gartshore states that there has been a good demand for merchandise for export, but the firm has not been able to fill anything like what is looked for because all home demands are being met first. He is looking for splendid business in 1920.

"Sit Down"

Sykes in Philadelphia "Public Ledger."

Discusses House Heating by Gas

Members of North-Ender Club of Toronto Hear Practical Address—Many Questions Asked Regarding the Results to be Obtained

"HOUSE Heating by Gas," was the subject of an illustrated lecture by H. S. Dodd of the Dodd Heating Systems to the members of the North-Ender Educational Club at their regular meeting on Thursday night. Besides the North-Enders several visitors from the other "Ender" Clubs attended.

Prior to the address a somewhat lengthy discussion ensued over the proposed new club house, which would be at the disposal of the various "Ender" clubs and which would be the headquarters of the Ontario Society of Domestic Sanitary and Heating Engineers. The special committee appointed to look into this matter have secured a site which they feel will be suitable for the purpose and they are now asking the individual members of the "Ender" clubs to express their approval, in hard cash. Lists are being circulated amongst the members, and they are asked to subscribe $100 each. The house selected for the purpose will, it is understood, cost about $10,000; and the annual maintenance cost in connection with the local and the Ontario societies about $6,250.

Are Enthusiastic

Considerable enthusiasm was manifested by the members in the discussion of the question and the consensus of opinion was decidedly in favor of the proposed club house. Moreover, the enthusiasm was expressed in a very tangible form, for many of the members of the North-Enders unhesitatingly signed for the $100. President Belyea intimated to the members of the club that he had told the central executive that the North-Enders would subscribe up to 90 per cent. of their membership and already they are within sight of this objective.

Mr. Dodd's Address

Mr. Dodd's address was illustrated by slides showing the construction of the Dodd gas furnace, a number of houses in which one of their furnaces has been installed, and charts showing the actual consumption of gas for such houses. In describing the Dodd furnace, Mr. Dodd directed attention to several of the more important features of the system. The heater element was removable so that the furnace could be cleaned; the observation window gave access to the pilot light and to the thermostat which could be fixed for the winter, thus securing a uniform heat during the entire winter season; to the safety valve which obviated all possibility of an explosion. Mr. Dodd said they advised installing a tile pipe so that the diffusion of the gas from condensation would not eat and finally destroy bricks and mortar.

Bricks Crumbled.

Reference was made by the speaker to one house where this was not done originally with the result that bricks in the chimney began to show evidence of crumbling but when this fibre pipe was installed, the trouble was overcome. Mr. Dodd explained that the varying pressure of gas was taken care of by the governor. The working efficiency of the system was about, on the average, 93 per cent, if the boilers were properly covered.

Illustrations of a number of houses in which the Dodd system had been installed were shown. One of these was a 13-roomed house, which included two bathrooms and a sunroom. It was of solid brick and had 880 feet radiation. From the first of December to the end of May the gas bill was $201. In the winter of 1917-18, about 18 tons of coal had been burned in this house. The gas company, said Mr. Dodd, were in the habit of giving a rebate on the use of gas for heating purposes, and in the case of the house he described, as well as others, the chart shown gave the figures after the rebate had been given.

Many Questions Asked

Following his address, a number of the members asked several questions of Mr. Dodd. In answer to these questions, Mr. Dodd explained that no extra premium was charged by insurance companies when a house was heated with gas used in their furnaces. The underwriters had examined the system and approved it. Their furnace, he said, would work with either steam radiation or hot water.

Several members wanted to know about the comparative cost of heating by gas and coal in an 8-roomed house. Mr. Dodd stated that they had estimated that in such a house the cost of heating by gas would be from ten to fifteen per cent. higher, if you did not include the cost of having a man to attend to the furnace. In that case, gas was a little the cheaper. At present, they had a 1,000 foot boiler, and a 750 foot boiler. They hoped, in the near future, to have a 500 foot boiler.

Mr. Dodd's address was listened to with great interest and at the conclusion of it, the thanks of the society was expressed by President Belyea.

Asking for First-Class Rates on Express Shipments of Electric Bulbs

A CASE in which the manufacturers and shippers of electric bulbs are vitally interested was recently brought to the attention of the Dominion Railway Board, which held a sitting in Toronto. As the law now stands, these bulbs are carried by the express companies at double first-class rate. The Canadian Manufacturers' Association, in taking up the cudgels for the producers and shippers, are asking for the normal first-class rate. They submitted evidence showing that electric lamps were carried in the United States and from the United States into Canada at the first-class rate. If was further shown that 22 per cent. of the export trade in this article from the United States in 1918 came to Canada.

The Company's Claim

The attitude of the express companies as voiced by the secretary of the Express Traffic Association, Mr. C. N. Hamm, was that incandescent lamps were very bulky and light in proportion to other goods, the result being that cars were often loaded with electric bulbs to the exclusion of the more profitable goods. To the contention of J. S. Walsh of the C. M. A. that lighter articles such as musical instruments, wicker furniture, tins, wire goods, etc., were carried at normal rates, Mr. Hamm replied that these articles were not sent in such quantities.

The Chairman's View

The chairman of the Board, F. B. Carvell, in championing the rights of the people, said: "I do not accept the idea that the express companies can say we won't accept a certain class of goods because it does not suit us. The express company is a public utility, and the people are entitled to use it if they like."

No decision was given by the board at the time of the hearing; and SANITARY ENGINEER learns from the C. M. A. that no judgment has yet been received by them of the attitude of the board in the matter.

The attitude of the C. M. A. in the matter is that the only justification the express companies would have for charging such a rate would be the percentage of breakages as being very high. This was not shown by the companies in the case which they presented to the board.

The Chemical and Engineering Company, Ltd., head office Ottawa, capital $50,000, plans to carry on a general engineering business including water, gas, sewage and drainage works.

EDITOR, SANITARY ENGINEER

Dear Sir,—

Would you please answer the following, as per sketches submitted, and oblige

How long would it take to heat the water in the tank in sketch No. 1? Stop-valve A is closed when tank is being filled from service. After tank is filled, valve B is closed and A opened. Both down and up pipes are level or flush with the tank bottom. Your reply will be much appreciated.

Subscriber, London, Ont.

About Ten Hours

Subscriber.—Lacking information regarding the heating capacity of the heater, and the required temperature of the water, it is difficult to give a very definite reply to the query: "How long will it take to heat the water in the tank?"

We are, however, assuming that the heater shown is one of that size ordinarily used in connection with a 30-gallon domestic tank, and that the water is to be raised from an initial temperature of, approximately, 42 degrees to a final temperature of 120 degrees above zero. If this assumption is correct, we may say that the time taken to effect the temperature change will be about ten hours. This is figuring for clean burners and a good quality of illuminating gas.

Of the two arrangements, the tank connections shown in the drawing marked Fig. 2 are superior to those shown in Fig. 1.

The stop-valve marked A in Fig. 1, and its corresponding valve in the return pipe of Fig. 2, should be omitted, as they serve no useful purpose, and may prove a source of destruction to the heaters in the event of being closed when the gas in the heaters is alight.

EDITOR, SANITARY ENGINEER

I want to instal a radiator as shown in the sketch enclosed, "Proposed radiator," which will be at the same height as the present heater which is in the house. Would this be effective?

E. N. ROOCH.

Should Run Pipe

E. N. Rooch.—To insure any degree of hot water circulation through a radiator set at the same level, or below the boiler, a pipe should be run up as high as possible and the radiator fed from that pipe, as indicated by the dotted lines that we have drawn on your sketch. The purpose of the overhead loop is to establish a temperature head sufficient to overcome the resistance of the trapped connection, that must be made in the radiator return to prevent the hot water in the lower part of the boiler backing into the radiator. The overhead loop may be vented to the expansion tank.

(Continued on page 38)

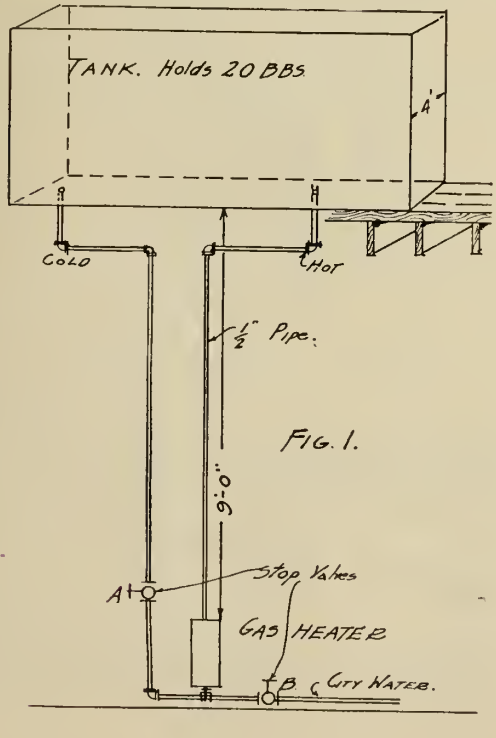


FIG. 1.

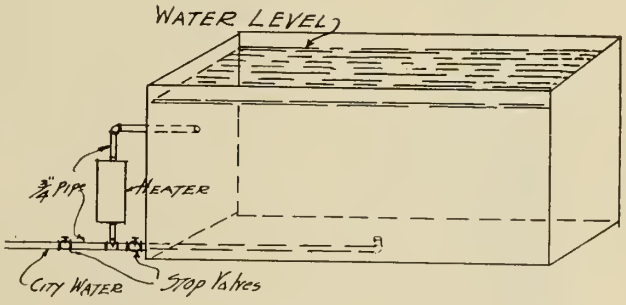
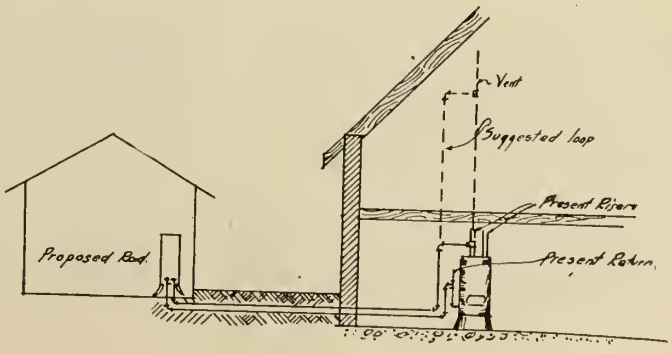


FIG. 2.



Market Conditions and Tendencies

Statements Regarding Supplies and Trend of Prices

THE MARKETS AT A GLANCE

THERE still continues to be a very strong tendency in nearly all lines of plumbers' and steamfitters' supplies and many important price changes have gone into effect. The continued industrial disturbances are causing serious shortages in many lines. Jobbers as a body are not generally charging premiums, but rather are trying to steady prices by selling at the official quotation, but claim it is necessary to charge a premium where they have to buy indirectly and at a higher figure.

Plumbers' brass work shows an advance of approximately 15 per cent. over former prices. Cement laundry tubs are now quoting at $2.00 each net higher than previously; closet combinations have advanced $2 each net, while white china closet combinations have advanced $3. Wrought pipe continues to be very scarce owing to the shortage of skelp; in enamelware the demand is said to be greater than the supply, although manufacturers have been increasing their output.

Steel showed an advance at the mills of $3 per ton and as this has a direct bearing on all steel or iron products, black sheets are reported higher. Compression work shows a 15 per cent. advance. Bath tubs are showing a demand greater than the supply. Ingots are firming with not much offering. Tin is some stronger, also spelter, with not much offering.

TORONTO, Ont., Nov. 14.—Higher prices are still the order and some changes have been noted. The general tendency is for higher prices, and reports indicate that further disruptions would have a very bad effect on the market generally. Sheets show a strong tendency owing to the scarcity. Ingots are firming, with tin and spelter showing stronger prices. Plumbers' brass and compression work advanced approximately 15 per cent. Some scrap materials advance while others show a decline with the market temporarily quiet. Enamelware still remains scarce, and manufacturers are finding difficulty keeping up with orders.

Closet Combinations Advance $2 and $3 Net

CLOSET COMBINATIONS have followed the general trend of enamelware; business has been exceptionally brisk in these, manufacturers having difficulty to keep anywhere within reach of the large orders that are pouring in from all sides. The advance noted above former prices is $2.00 net, while white china is up $3.00 net.

Cement Laundry Tubs Are Up $2 Net

CEMENT LAUNDRY TUBS.—The demand has been very brisk for cement tubs and has exceeded the supply, owing to the increased amount of building which has taken place this season, it is stated, and building, instead of slackening off, seems to be increasing, which makes it harder for jobbers to catch up with orders. The new price shows $2.00 net higher than previous prices.

Waste and Oakum Firm; Show No Change

WASTE AND OAKUM.—No change has been noted, although cotton has been very active on the American markets. A good demand is reported, and no immediate change is expected in the price. The quotations are as follows:

	Per 100 lbs.	
Best American	$21 00	$22 00
Clipper, spun	....	21 00
Do., unspun	....	19 50
Plumbers' spun	10 00	10 75
WASTE		
Cream, Polishing	....	0 21
White—		
XXX	....	0 18
XX	....	0 16¾
X	....	0 15¾
XC	....	0 13½
Japanese	....	0 13
XXX Extra	....	0 19
XX, grand	....	0 17¾
XLCR	....	0 16½
X Empire	....	0 15¼
X Press	....	0 14
Colored—		
No. 5	....	0 13¾
No. 1	....	0 12¾
No. 7	....	0 11¾
No. 1A	....	0 10¾
No. 1B	....	0 09¾
Fancy	....	0 15
Lion	....	0 13½
Standard	....	0 12
Popular	....	0 10½
Keen	....	0 09

Above lines subject to trade discount for quantity.

Boiler Tubes Show No Change

BOILER TUBES.—While the boiler tube situation is not so serious as the pipe, there is a slight scarcity. Jobbers, however, state that tubes are coming in fairly well, and they are able to handle all business offering with a fair amount of service. The prices now quoting are as follows:

	Per 100 feet	
BOILER TUBES—	Seamless	Lapweld
1 inch	$27 00	.....
1¼ inch	29 00	.....
1½ inch	29 50	.....
1¾ inch	32 00	$27 00
2 inch	31 00	26 00
2¼ inch	35 00	28 00
2½ inch	43 00	32 00
3 inch	49 00	40 00
3¼ inch	.....	47 00
3½ inch	60 00	44 00
4 inch	75 00	56 00

Lead and Zinc Products Show No Change

LEAD AND ZINC PRODUCTS.—Although the raw materials for manufacturing these products have changed to somewhat higher levels there is no change made in them to date. The seasonable demand is said to be excellent. It would be difficult to predict whether a change will take place in the near future, but none is looked for at present. Quotations are as follows:

Lead pipe, list, per lb.	....	$0 12½
Lead waste pipe, list, per lb.	....	0 13½
Do., over 8 inches, list, per lb.	....	0 14½
Above subject to discount of 10%.		
Lead traps and bends	....	15%
Lead wool, lb.	0 11	0 12½
Lead sheets, 4 to 6 lbs., sq. ft., in rolls, lb.	0 12	0 13
Cut sheets ½ to ¾c lb. extra and cut sheets to size, 1c lb. extra.		
Solder, guaranteed, lb.	0 35½	0 38
Solder, strictly, lb.	0 34½	0 37
Solder, commercial, lb.	0 32½	0 35
Solder, wiping, lb.	0 31½	0 34
Solder, wire, lb.	0 35½	0 41
Zinc sheets, per lb.	....	0 17

Some Scrap Materials Up, Others Weaker

SCRAP AND WASTE MATERIALS show some advances with a firmer market noted on heavy lead pipe, stove plate, heavy copper machinery. While a lower price is noted on old rubbers, boots and shoes, overseas, lumbermen's rubber boots. As industrial disturbances gradually settle it would not be surprising to note numerous changes in scrap materials of all kinds. At present, however, the tendency seems to be a rather quiet one. Quotations are as follows:

DEALERS' BUYING PRICES		
Tea lead	....	0 03½
Heavy lead pipe	....	0 05¾
Pipe scrap	....	8 00
Stove plate, per ton	....	17 50
No. 2 busheling	....	11 00
Yellow brass	....	0 10
Red brass	....	0 16¾

MADE IN CANADA

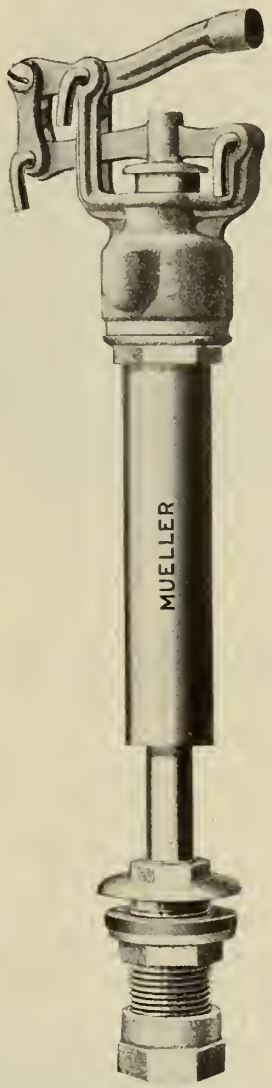
MUELLER

Compound Lever Action Ball Cock

Made for High Up and Low Down Tanks

NOTE—Can be furnished with either 5/8" or 1/2" shank with tail-pieces for 3/8" I.P. or 1/4" I.P. respectively.

THE A-1270 MUELLER Compound Lever Action Ball Cock is high grade in every respect and like other Mueller Products is "Fully Warranted." All parts are made of Red Brass with high copper content; tested at 200 lbs. pressure. The hush tube on the High up Cock surrounding Cast Brass Supply Tube ensures silent action; fitted with compound lever action controlled by thumb screws. Easy access to all working parts enable repairs to be made without removing Ballcock from tank. Rigid inspection after every process of manufacture ensures perfect operation.



A-1270

H. MUELLER MFG. CO., LTD.

SARNIA **CANADA**

SEND FOR OUR CANADIAN CATALOGUE "A"

MADE IN CANADA

Light brass	....	0 07
Scrap zinc	....	0 06
Heavy copper	....	0 18½
Wrought iron, No. 1, per gr. ton	....	14 00
No. 1 machinery cast	....	22 00
Heavy melting steel	....	14 00
Old rubbers, boots and shoes	....	0 06
Overseas, lumbermen's rubber boots	....	0 04
Bicycle tires	....	0 01½
Automobile tires	....	0 03

Soil Pipe and Fittings, Prices Still Hold

SOIL PIPE AND FITTINGS.—The demand still continues for soil pipe, and no change in prices are noted. Labor conditions are still a factor in the high price of this commodity. No increased production is looked for till winter sets in as manufacturers are working to capacity. However, when the winter sets in it is expected production will catch up with the demand, and probably get ahead in order to be able to cope with the large demand expected in the spring. Quotations are as follows:

Medium and extra heavy soil pipe, 2, 3 5 and 6 in.	10%
Medium and extra heavy soil pipe, 4 in..	15%
Medium and extra heavy soil pipe fittings, 2 in. to 6 in.	25%
8 in. extra heavy pipe and fittings	5%

PIPE FITTINGS

Cast iron fittings	10%
Plugs	22%
Bushings	25%
Unions, ¼" to 2½"	40%
Do., 1¼", 3" and larger	35%
Dart unions, ¼-inch to 2-inch	25%
Do., 2½-inch and larger	15%
Nipples, up to 4-inch	77½%
Do., 4½-inch and larger	67½%
Do., running thread 4-in. and under	47½%
Couplings, 4-in. and under	40%
Do., 4½-in. and larger	20%

MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittings, Class A, lb..	$0 57	$0 72
Do., Class B, lb. net	0 25	0 35
Do., Class C, lb. net	0 19	0 25

Wrought Pipe Unchanged; Continues Scarce

WROUGHT PIPE.— At present almost a famine in wrought pipe is being felt; that is to say, in some sizes. The shortage of skelp continues to be the main factor and as considerable skelp comes from the United States, the recent strikes have disrupted shipments. However, some relief is offering by substituting steel where consumers are willing to accept and pay the difference in price. Quotations are as follows:

WROUGHT PIPE

Price List No. 40, July 4, 1919

Standard Buttweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
⅛ in.	$ 6 00	$ 8 00	$.....	$.....
¼ in.	4 53	6 66	5 13	7 26
⅜ in.	4 53	6 66	5 13	7 26
½ in.	5 99	7 57	6 84	8 42
¾ in.	7 53	9 66	8 68	10 81
in.	11 14	14 28	12 84	15 98
1¼ in.	15 07	19 32	17 37	21 62
1½ in.	18 01	23 10	20 76	25 85
2 in.	24 24	31 08	27 94	34 78
3 in.	50 87	65 03	.....	.....
2½ in.	38 90	49 73	.....	.....
in.	76 85	97 01	.....	.....

Standard Lapweld

	Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
2 in.	$ 27 94	$ 34 78	$ 31 64	$ 38 11
2½ in.	49 66	51 48	46 51	57 33
3 in.	53 17	67 32	60 82	74 97
3½ in.	66 70	83 72	75 90	92 92
4 in.	79 03	99 19	89 93	110 09
4½ in.	88 00	113 00	107 00	132 00
in.	103 00	132 00	125 00	154 00
in.	133 00	171 00	162 00	200 00
in.	175 00	224 00	211 00	259 00
8L in.	184 00	235 00	221 00	273 00
9 in.	254 00	324 00	305 00	376 00
10L in.	235 00	301 00	283 00	349 00
10 in.	303 00	387 00	365 00	449 00

Terms, 2% 30 days, approved credit.
Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Compression and Plumbers' Brass Work Up 15%

COMPRESSION AND PLUMBERS' BRASS work show an advance of practically 15 per cent. This is not unexpected, and it has been stated if Europe comes into the market another advance would not be unlikely. The demand for this commodity has continued very brisk and seems to be increasing. Quotations are as follows:

Compression work, standard	28%
Fuller work, standard	34%
Bath cocks, compression	30%
Bath cocks, Fuller	34%
Flatway stop and waste cocks, standard	32%
Roundway stop and waste cocks, standard	32%
Brass steam cocks, standard	Net List
Globe, angle and check vales, standard	5-9%
Do., removable disc	7-10%
Radiator valves, standard	15%-23%
Do., removable disc	40-46%
Basin Cocks	
No. 0 and 1, Fuller pattern	34%
Compression	23%
Quick opening	34%

Range Boilers Steady; in Good Demand

RANGE BOILERS.—There has been a good demand for range boilers. Prices do not show any change, and manufacturers are not generally looking for any at present, they state. A general business increase is noted in nearly all lines of plumbers' supplies, and is no doubt due to the large amount of building which is being done. Following are present quotations:

Range Boilers	Standard	Extra Heavy
30-gallon	$11 00	$12 50
35-gallon	13 50	15 50
40-gallon	15 25	17 25
52-gallon	20 50	25 00
66-gallon	32 00	38 00
82-gallon	40 00	47 00
100-gallon	50 00	58 00
120-gallon	60 00	67 00

Conductor Pipe Firm; Showing No Change

CONDUCTOR PIPE AND EAVE-TROUGH continue firm with a good business offering. An immediate change is not expected, although higher prices would not be surprising, owing to the scarcity of galvanized sheets. Following are quotations:

PIPE (Conductor)	Plain
2 in., in 10-ft. lengths, list	8 00
3 in., in 10-ft. lengths, list	9 70
4 in., in 10-ft. lengths, list	12 80
5 in., in 10-ft. lengths, list	17 50
6 in., in 10-ft. lengths, list	21 30

F.o.b. Toronto, Ottawa, Oshawa.
List less 10%.

Enamelware Firm; Continuing Scarce

ENAMELWARE continues, if anything, to be scarcer than before, bathtubs particularly. Manufacturers a while back felt confident they could catch up with their orders, which were held up by the strike which occurred in the spring and lasted well into the summer, but on account of the increased demand have not been able to do this and have difficulty in keeping within two or three weeks of the amount called for. It was unofficially mentioned by one maker that the increased demand was so great that notwithstanding the fact of increased labor, and providing they were able to manufacture five hundred bath per day of the present output, at the end of six weeks' time they would just be comfortably able to take care of the business offering. The following are quotations on some of the better known lines:

Bath tubs, roll rim, 4. 4½, 5 feet, 24 to 30 in. wide	$37 05
Bath tubs, 5½ ft.	41 20
Lavatories—	
17x10" Apron F139 or P4045	11 05
18x24" Apron F154 or P3845 or P3847.	17 00
18x21" Apron F169 or P4205	12 70
18x21" Roll rim F197, F199 or P4655-6	11 10
17x19" Roll rim F241 or P4345	9.05
Sinks, roll rim, 18 x 30 in.	16 60

Sinks, flat rim—	1 only	2 only	3 only
16 x 24	$5 40	$5 35	$5 30
18 x 30	6 20	6 50	6 10
20 x 30	7 10	7 05	7 00
Closets, oak tank and seat			26 50
Do., enamel iron or white vitro tank			30 00

Sheets and Plates Scarce; Black Shows Advances

SHEETS AND PLATES—Owing to recent steel strikes and also coal strikes black sheets are reported to have reached a higher figure, which is not surprising. Another factor is the extreme scarcity of both black and galvanized sheets, which are said to be almost a famine, and any shipments that do reach are used up before there is a chance to stock up the warehouse, and very little has a chance to trickle through as far as the warehouse. There seems no available stocks at the mills, and it is stated that any shipments that do reach are stocks of odds and ends that have been laying around the mills. It was expected that manufacturers would be able to put some on the market to relieve the situation, but apparently they have been so far behind, that what is being manufactured is handed around in small dribs, and a hand-to-mouth proposition prevails. The following quotations are current at present:

BLACK SHEETS—		
14 gauge	5 45	6 00
16 gauge	5 60	6 50
18-20 gauge	5 15	6 55
22-24 gauge	6 20	6 60
26 gauge	6 30	6 65
28 gauge	6 45	6 75
3-16 inch plate	4 90	5 25
¼-inch boiler plate	4 50	5 80

Prices shown are for full cases. An extra charge of from 25c per 100 lbs. is made for less than case lots.

GALVANIZED SHEETS.

	Premier		Apollo	
10¾ oz.	8 90	9 50	8 00	9 25
U.S. 28	8 30	9 90	7 60	8 55
U.S. 26	7 90	8 50	7 30	8 20
22 and 24	7 70	7 90	7 15	8 00
18 and 20	7 50	7 70	7 00	7 80
16	7 25	7 50	6 85	7 60
12 and 14	7 05	7 25	6 70	7 35

An extra is now charged on galvanized sheets, 10¾ oz. and 28 ga., when shipped out in sheets 3 feet wide. The extra charged over prices shown above is 20c per 100 pounds. Other gauges show no change for different widths.

Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

Ingots, While Quiet, Show Upward Tendency

INGOT METALS.—The tone of the market generally are strong, and if it is possible to arrange finance with Europe, higher prices will undoubtedly be paid. Up to the present time, however, ways and means have not been satisfac-

Continued on page 31

Look on Drawings for

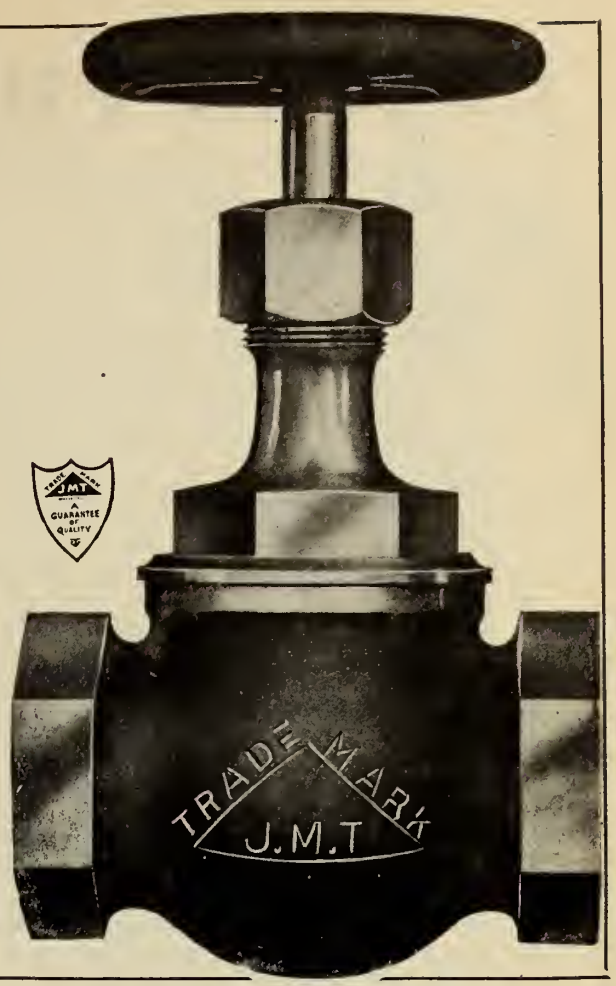
"J.M.T."

It's on most specifications

Morrison Valves are so well known to men in the mechanical field that they seldom think of specifying others.

Engineers, draughtsmen and designers are responsible and answerable for the work they plan, so their action infers perfect confidence in Morrison Products. Customers buy them readily for the same reason.

James Morrison Brass Mfg. Co.
LIMITED
93-97 Adelaide Street West - Toronto



NATIONAL

Pneumatic and Storage Tanks

The Factory that builds a perfect tank

Send for prices and discounts.

NATIONAL STEEL TANK AND MFG. CO.
BRADFORD, ILLINOIS, U.S.A.

IS THIS THE SOLUTION?

Another scheme to rectify the distressing prices now prevalent, by other than sound economic measures, was outlined before the Union of Canadian Municipalities which recently convened at Kingston.

THIS RESOLUTION HITS YOU WHERE YOU LIVE

"We submit the principal root of the evil is the present wasteful, inefficient and antiquated method, or rather lack of method, of distributing the goods from the producer and manufacturer to the consumer—wasteful of time, labor, health, happiness and even human life—inefficient and antiquated in this age and to such an extent that even the huge economies effected by the greatest array of labor-saving machinery the world has ever seen are in a large measure rendered null and void. An ever-increasing army of unregulated distributors and relatively an ever-decreasing army of producers with the leaders of all these practising profiteering and price-manipulation as their fancy may dictate or opportunity may permit.

"Among the minor causes are the various classes of idlers and usurers, who in devious ways levy toll on labor and industry. Waste of time in high schools and colleges teaching dead languages and other unpractical subjects to the partial or total exclusion of vocational training, economics and useful branches of learning which would be of greater value for purposes of mind development and discipline and thereafter more useful to the individual and the country."

SAYS THE FINANCIAL POST IN REPLY:

"It is, of course, possible that there might be a dissenting voice, heard above this chorus of condemnation. A voice that might suggest, for instance, that the fact that the producer is getting $24.50 per hundred for hogs, where he formerly got $6, might, perhaps, have as much to do with the matter of increased cost as the inefficient handling that gives to the packer 5-16 of a cent per pound on bacon, or to the retailer a bare 5 cents a pound. Or the fact that the farmer is now guaranteed a price of $2.15 a bushel for wheat that formerly he sold with satisfaction for 90 cents, may be as much responsible as the half cent a loaf profit of the baker, or the cent profit of the retailer.

"It is a question, too, whether all the blame for the trying conditions of the present time should be laid at the door of established trade, any more than at any other door. There seems no good evidence for believing that the business morals of the merchant class are worse than any other, and there might be those who might reply to the stricture that our schools and colleges are not devoting their attention strongly enough to the bread and butter needs that "man does not live by bread alone."

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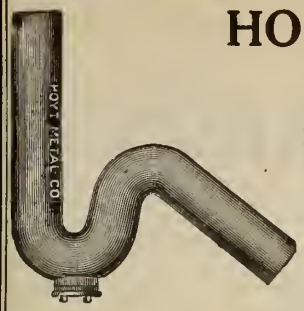

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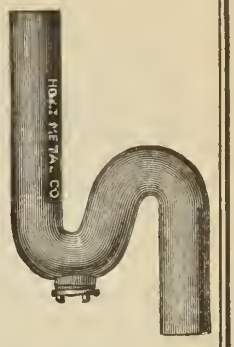

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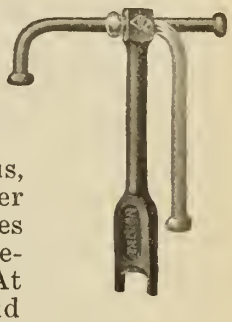

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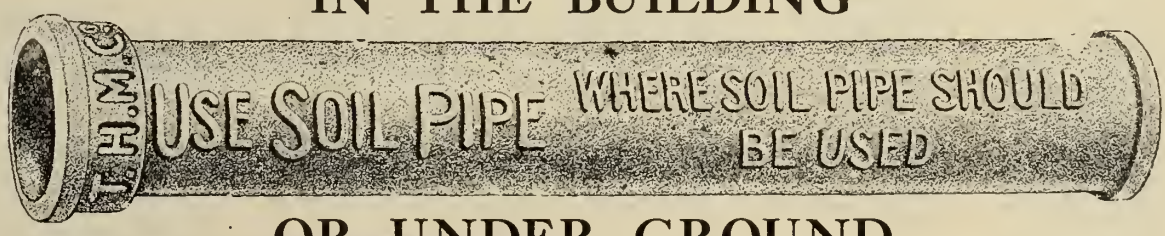

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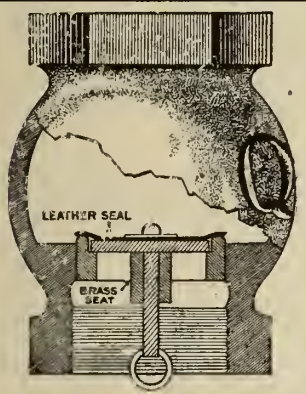

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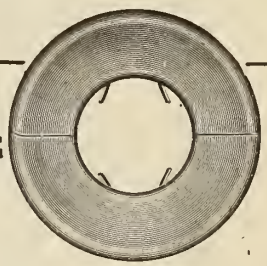


TOP VIEW
NO. 10-A

THE NO. 10—A NARROW FLANGE PLATE—IS A STEEL HINGED PLATE. FLANGES ¾" WIDE. HIGHLY FINISHED. ESPECIALLY DESIGNED FOR TWIN CONNECTION "NARROW."

Gem No. 4.

The split ceiling plate is coming more and more into use than ever and ALWAYS GIVES A NICE FINISH, because it can be attached to mains and risers at the very last, and is not exposed during completion of a building on the floors.

High quality at the right price.

Gem No. 4 Automatic Air Valve

Made from the best brass obtainable. Pressed shell and pressed brass base which eliminate danger from blowholes, which is a fault with cast bases.

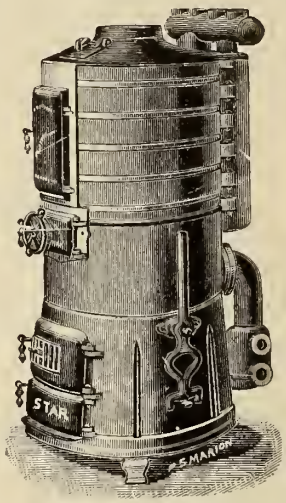
Write for catalog showing our complete line of specialties.

The BEATON & CADWELL MANUFACTURING Co.

New Britain, Conn.

Eastern Agent: J. R. Devereux & Co., 358 Beaver Hall Square, Montreal. Western Agent: A. E. Hinds & Co., Chamber of Commerce, Winnipeg.

Thousands of Star Boilers in Use requiring repair Parts



It will be a long time before folks forget the coal troubles of the last few seasons.

The principal feature of the Star Boiler is that no other round hot water boiler has any coal-saving improvement not embodied in the "Star."

Then, too, while boiler installation and repair time is here, why not stock up with Star parts, for which O. Belanger has taken over the rights and is now making?

Many thousands of Star Boilers are in use requiring these repair parts hitherto unobtainable.

Write to us at once in time to catch the season's business.

We guarantee prompt deliveries.

O. BELANGER, REG'D.

Amherst Street

MONTREAL

"Crandon" Heat Regulators

Here's a Question

Would you send out a team without reins—would you try to drive an auto without a steering wheel? That's what you do when you instal a heating system without a heat controlling service.

Don't Do it again. But Remember this

Every heating system now installed is like a runaway horse. It is running away with the world's coal supply, and you are casting lots of profit by neglecting to sell the Crandon heat regulator. Get right in line at once. Make more profit and become a real fuel conserver at the same time.

Plain Thermostat
No. 10

INDEX TO ADVERTISERS

Allison, Kenneth B. 46
American Technical Society 6
Amherst Foundry Co.....Inside Front Cover
Anthes Foundry, Ltd. 14
Armstrong Mfg. Co., The 48

Beaton & Cadwell 46
Beaton & Corbin 48
Belanger Regd., O. 46
Borden Canadian Co. 48
Buffalo Specialty Co. 6

Canada Metal 13
Canadian Brass Co. 11
Canadian Consolidated Rubber Co. 44
Canadian Society Domestic and Sanitary Heating Engineers, The 4
Canadian Fairbanks-Morse Co. 46
Canadian Tube & Iron Co. 45
Chamberlain Desolvo Co. 45

Empire Manufacturing Co...Outside Ft. Cover

Galt Brass Co. .....Back Cover
Gurney Foundry Co. 9

Hamilton Stove & Heater Co. 48
Hause Mfg. Co., Chas. F. 48
Hoyt Metal Co. 41
Hungerford, U. T., Brass & Copper Co... 48

International Malleable Iron Co. ..... Inside Back Cover

Jardine, A. B., & Co., ... 7

Katie Foundry Co. 41
Kerr Eng. Co., Ltd., ...Inside Back Cover

Long & Co., R. G. 45

McDougall & Co., R. 45
Moline Heat 7
Morrison Brass Mfg. Co., Ltd., Jas. 39
Mueller Mfg. Co., H. 37

National Steel Tank & Mfg. Co. 39

Port Hope Sanitary Mfg. Co. 24-25

Scaife, W. B., & Sons Co. 43
Steel & Radiation, Limited 8
Standard Sanitary Mfg. Co. 1
Sturtevant, B. F., Co., of Canada 2-3

Trimont Manufacturing Co. 44
Toronto Hardware Mfg. Co. 43

United Brass Founders & Engineers, Ltd., 8
War Purchasing Commission 9

Warden-King, Ltd. 5
Wallaceburg Brass Co. 14
Williams, J. H., & Co. 41
Wolverine Ltd. 41

X Laboratories 47

There's Something about an Original that Can Never be Imitated!

IF you've ever heard Harry Lauder sing his Scotch songs you could tell an imitation with your eyes shut.

You've seen Charlie Chaplin do his stunts—do you think an imitator could fool the people?

Whether it's real diamonds or paste—whether it's pure gold or brass—an imitation is simply an imitation—**and nothing else.**

That's why the thoughtful steamfitter isn't going to fall for anybody's talk about something "just as good" as "X" Boiler Liquid. He knows that for positive results it is safer to stick to the original. An imitation of the genuine "X" may look like it — but that's all. Patents are allowed on the "X" Liquid process. Its quality **can't** be imitated. Imitations of the genuine "X" Liquid cause foaming. **"X" will prevent foaming.**

No fitter can afford to experiment with his profits. When you get a leaky or cracked boiler job you want to know that you can send any man to that job—have him finish it quickly—otherwise there's the kicking, the arguing and the time-wasting that is utterly useless from a money-making standpoint.

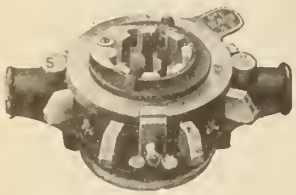
Over 25,000 steamfitters now know that "X" Liquid is the **only** scientific process for repairing leaky and cracked boilers—and for making them LEAKPROOF—RUSTPROOF — AND SCALEPROOF. They know that with "X" they make three times the profit that they could by dismantling and welding.

And they wouldn't risk their reputations experimenting with an imitation.

"X" LABORATORIES

636 Washington St. Boston, Mass., U.S.A.

Constant Sales Increase

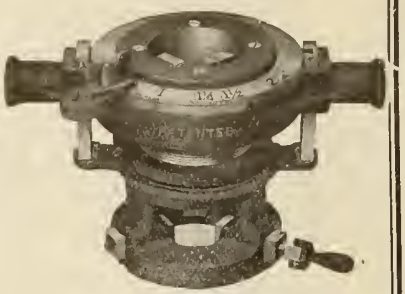


6 Beaverette to ¾ inch.

This efficient little die stock has been about 10 years on the market with constantly increasing sales.

The only tool that threads ¼, ⅜, ½ and ¾ without changing dies or bushings. Two sets of dies are operated by one handle.

Beaver 25 and 26 1 to 2" are alike except that 26 has ratchet attachment. They operate on the Beaver receding die principle—the further you thread the easier the labor. A man of ordinary strength can cut a 2-inch thread with one hand. Together these tools cut ¼ to 2-inch pipe without change of dies or bushings.



No. 25 Plain 1 to 2 inch.

Borden-Canadian Co.

110 Church Street - Toronto

GENUINE

ARMSTRONG STOCKS and DIES

Hinged Pipe Vises *Pipe Cutters*

Pipe Threading Machines

—MANUFACTURED BY—

THE ARMSTRONG MFG. Company

317 Knowlton Street BRIDGEPORT, CONN

248 Canal Street NEW YORK

"BC"

COMBINATION COLD ROLLED STEEL Floor and Ceiling PLATES

Carried by the leading supply houses

No. 15

Puts just the right finish on that heating job

Send for catalog of complete line of "B. & C." goods.

No. 1 Valv

Stock carried by our Canadian Representative W. H. CUNNINGHAM & CO. 183 Church Street Toronto, Ont.

No. 16

The Beaton & Corbin Mfg., Co. Southington, Conn., U.S.A. The Old Original Company

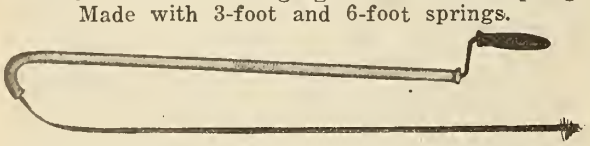
No. 17

Chas. F. Hause Mfg. Co., Ltd.

Manufacturers of the

Hause Closet Auger

Seamless brass tube—high-grade 7-16 steel spring. Made with 3-foot and 6-foot springs.



Ask your jobber or write us direct. Made in Omaha, Nebraska, U.S.A.

Canadian Distributors

Empire Mfg. Co., Ltd., London and Toronto

"Star Brand" Seamless Brass and Copper Tubes

including

Iron Pipe Sizes

also

Seamless Brass Condenser Tubes

READY FOR IMMEDIATE SHIPMENT

from our New York Warehouses

Also a complete line of Mechanical Cold Drawn Seamless Steel Tubing

U. T. Hungerford Brass & Copper Co., Lafayette, White and Franklin Sts., New York, U.S.A.

WE CARRY A FULL LINE OF-

BOILERS, RADIATORS, WARM AIR FURNACES & REGISTERS.

HAMILTON STOVE AND HEATER COMPANY LIMITED.

HAMILTON CANADA.

Have You Taken Down Your Sign?

A prominent merchant who has made a great success of all branches of his business has said that withdrawing advertising from a good trade paper is like taking down your sign. Advertising to the trade you serve is business insurance, but premiums must be kept up or the policy will lapse.

There never was a time when the trade was keener for business information. That is why the advertising pages of the Sanitary Engineer are being followed so closely at the present time.

Pipe Fittings

Made in Canada

The Brand that has the Quality

M Brand Pipe Fittings, etc., give a service and satisfaction that will invariably get you re-orders and much new business as well.

A trial of the goods will prove this claim.

CAST IRON FITTINGS

With this brand mean fittings made with iron of high tensile strength—proper proportions and correct tappings.

RECESSED DRAINAGE FITTINGS

MALLEABLE FITTINGS

With this brand mean fittings made of Air Furnace Refined Iron, reamed and tapped to gauge with perfect threads

Standard and Extra Heavy Flanged Fittings and Flanges. Galvanizing Malleable and Gray Iron Castings of all Kinds.

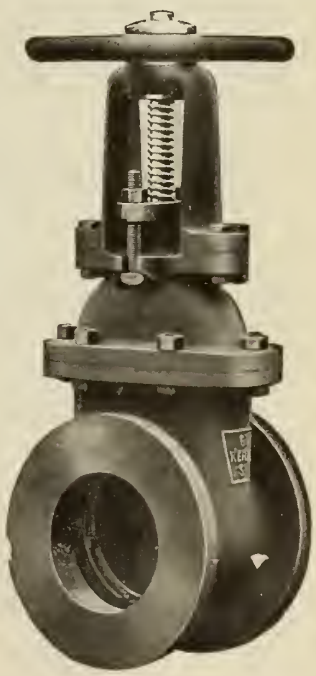
International Malleable Iron Co., Limited, Guelph, Ontario, Canada

There Are Lots of Gate Valves

Advertised and Sold

but not all of them possess that neat appearance, combined with strength and stability, which characterizes

KERR IRON BODY GATE VALVES



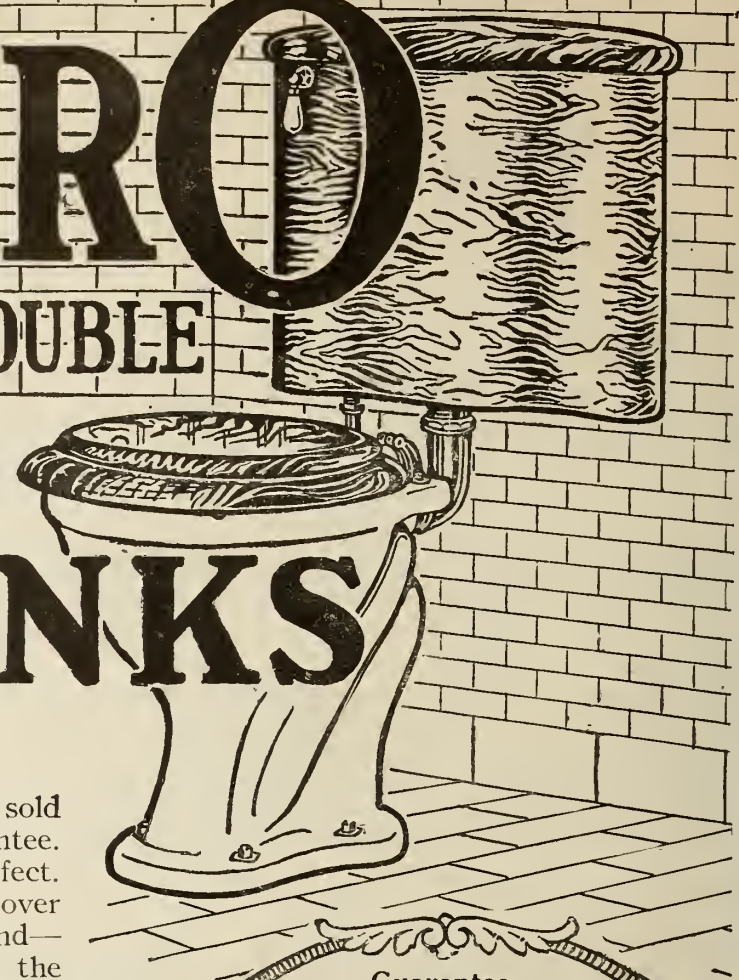
Specify KERR'S (KEYSTONE) Iron Body Gate Valves on your next order, and let us prove what we claim for them.

Our Catalogue No. 5 tells all about them. It is yours for the asking. Write us to-day.

Approved by the Fire Underwriters' Association, and Registered by Boiler Inspection Departments of Ontario, Saskatchewan and Alberta.

THE KERR ENGINE COMPANY, LIMITED - Walkerville, Ontario

VitrO NO-TROUBLE TANKS



THE VitrO Tank is sold by us and sold by you under an absolute guarantee. Workmanship and material is perfect. If not—if you or your customers discover a flaw that our inspectors failed to find—you get a new tank. Simply return the defective tank to the jobber where you got it and he is authorized by us to exchange it for one that *is* perfect. This guarantee holds good any time, provided, of course, the defects are not the effects of carelessness or abuse.

Absolutely Guaranteed

The VitrO Tank won't be found defective very often—rest assured on that. No trouble with the VitrO—either for the customer, the plumber or the jobber. It never leaks because it is all in one piece with no seams or lining. It can't corrode, crack, or warp—the VitrO isn't built that way.

Fitted with VitrO Lever, VitrO Flush Valve and VitrO Ball Cock tested to close off at any pressure from 1 to 150 pounds—and guaranteed to do so. All finishes, enamel, oak, mahogany.

Have you seen the VitrO Catalogue? Write us or your jobber. You'll appreciate our Guarantee.

Guarantee

WE guarantee that should a VitrO Tank at any time prove defective through either material or workmanship, a new one will be given to the plumber by the jobber from whom he purchased it. In no case will credit be given to the jobber until the defective tank is returned and examined, and when a tank is returned same must be complete with all fittings; otherwise, credit will be given based only on the value of the goods returned.

Exception

This guarantee does not apply to defects caused by carelessness or abusive wear and practice.

Note

A VitrO Tank must not be returned because of a defective fitting or cover. A defective fitting or cover will be replaced at once; however, the defective one must be returned for examination.

When tanks are broken in transit, claim must be made against the Railroad Company.

Galt Brass Company, Limited

Galt - Canada

Sanitary Engineer
Plumber and Steamfitter of Canada
VOL. XIII. PUBLICATION OFFICE, TORONTO, DECEMBER 1, 1919 No. 23

PLAY SAFE!

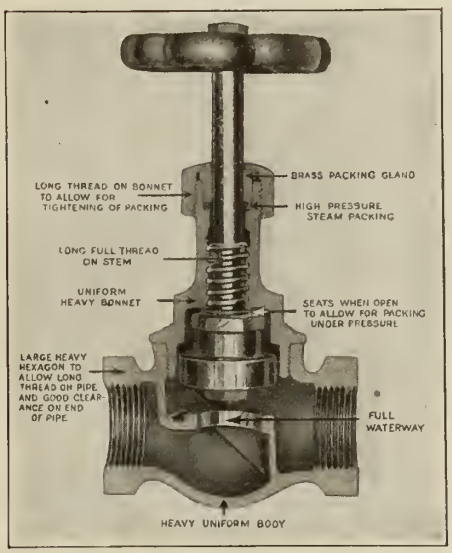

LONG THREAD ON BONNET TO ALLOW FOR TIGHTENING OF PACKING
BRASS PACKING GLAND
HIGH PRESSURE STEAM PACKING
LONG FULL THREAD ON STEM
UNIFORM HEAVY BONNET
SEATS WHEN OPEN TO ALLOW FOR PACKING UNDER PRESSURE
LARGE HEAVY HEXAGON TO ALLOW LONG THREAD ON PIPE AND GOOD CLEARANCE ON END OF PIPE
FULL WATERWAY
HEAVY UNIFORM BODY

PLATE A840
JENKINS DISC GLOBE VALVE

THE whole steam system will be dubbed wrong if a faulty valve is installed, no matter how good the other fittings are.

The sanitary engineer cannot afford to have his good work reflected upon by so small, yet so important, a factor of the work.

Make sure that the valve is right above everything else.

"Emco" valves are fitted with special high heat-resisting "Radium" discs which last a lifetime.

They are registered in all provinces of the Dominion, our ordinary line being approved for 175 lbs. working pressure.

All goods are thoroughly inspected and tested before they leave our factory.

Send for our catalogue. Specify "Emco" valves from your jobber or order direct from us.

Empire Manufacturing Co., Limited

London and Toronto
Canada

A Beaver Brand Pedestal
is a Lavatory Fixture Worth While

A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

A bathroom which is fitted with Beaver Brand cast iron enamel ware bears the stamp of quality and lasting service, and a pedestal lavatory puts such a bathroom in a class by itself.

Ask your jobber for BEAVER BRAND CAST IRON ENAMEL WARE

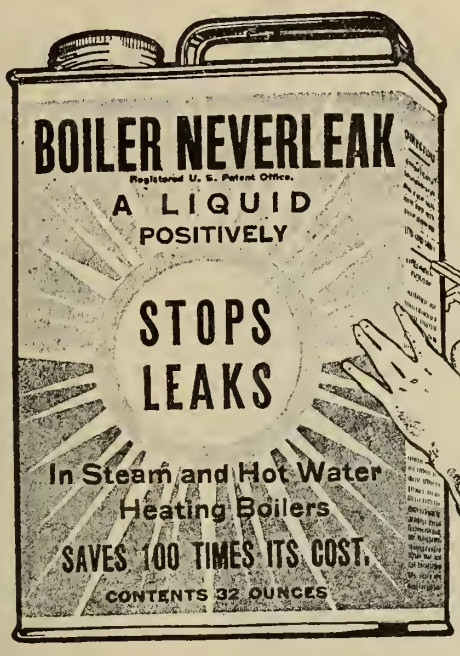
Amherst Foundry Co., Limited

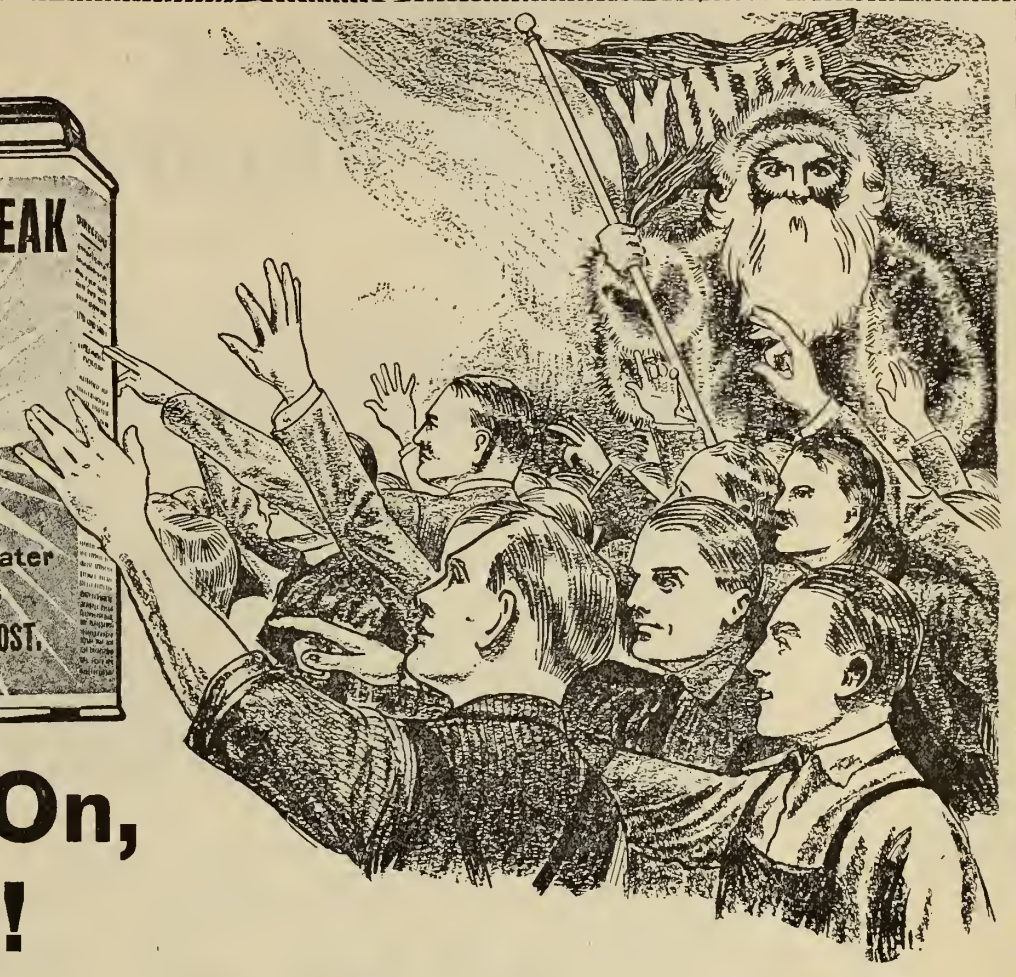
General Offices and Factory: Amherst, Nova Scotia

AGENCIES:

ONTARIO:
Monarch Brass Mfg. Co., 71 Brown St., Toronto

MANITOBA and NORTHWEST:
E. B. Plewes, 120 Lombard St., Winnipeg





Come On, Fitters!

"$50.00 an Hour" Days are Here. Join the Crowd.

Old man Winter is just around the corner. Get ready for the cold snap and those boiler repair jobs. This winter, more than any other, you will need your old friend

BOILER NEVERLEAK

No tearing down boiler, no waiting for repair parts—no angry customers—a clean, quick, **permanent** repair in an hour's time, that's what you want and **that's what you get** with Boiler Neverleak.

You take no risk. Tackle that next leaky steam or hot water heating boiler with a can of Boiler Neverleak and a pipe wrench. You are protected by our $1,000,000 guarantee which clearly states that you get your money back or we will replace the goods, free, at your option, if Boiler Neverleak doesn't do all we claim and make a perfect, satisfactory repair.

You can easily get $50.00 an hour. Give Boiler Neverleak a trial. It will honestly surprise you and help you this winter. Made by specialists in Neverleak products for twenty-five years.

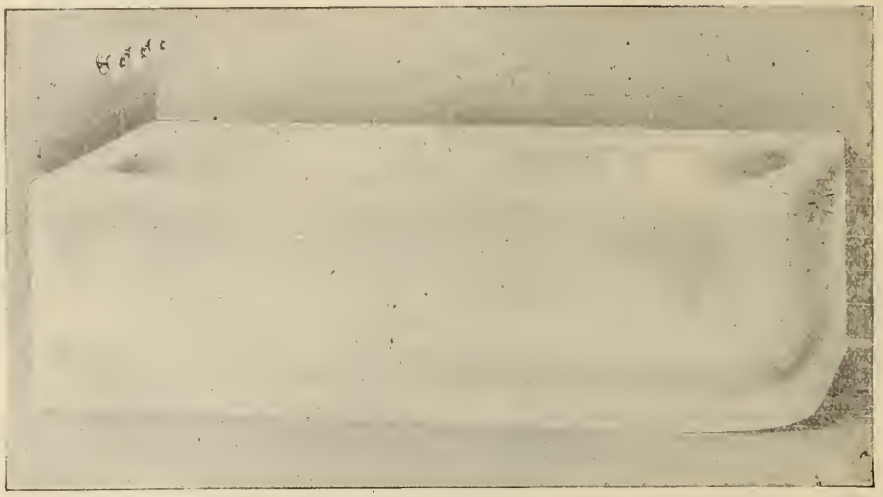
Send for our free trial offer.

BUFFALO SPECIALTY COMPANY, 352 Ellicott St., Buffalo, N. Y.

SANITARY ENGINEER, December 1, 1919, Vol. XIII., No. 23. Published 1st and 15th of every month at 143-153 University Ave., Toronto, by The MacLean Publishing Co., Ltd. Yearly subscription price, Canada, $1.00; United States, $1.50; Great Britain and the Colonies, 4s. 6d.; elsewhere, $2.00. Entered as second-class matter at the Post Office Department, Ottawa. Entered as second-class matter July 1st, 1912, at the Post Office at Buffalo under the Act of March 3rd, 1879.

"Standard"
"Perfection" Built-in Baths

Made in One Piece Enamelled All Over



These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in-Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners meaning bathroom sanitation.

Made in 5 and 5½ foot sizes.

Illustrations on request.

Write the nearest dealer

Standard Sanitary Mfg. Co.
Limited

General Office and Factory: Royce and Lansdowne Aves., Toronto, Ontario

Toronto Store:
55-59 Richmond Street East

Winnipeg Showrooms:
76 Lombard Street

Hamilton Store:
20-28 Jackson Street West

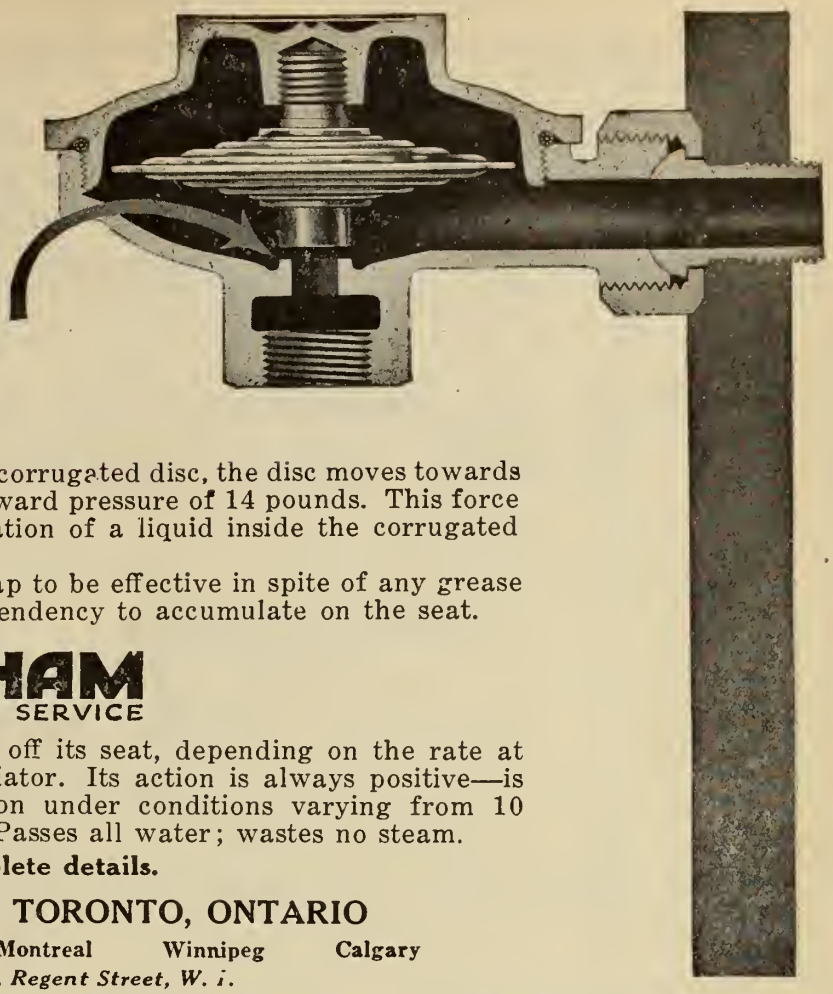
Montreal:
358 Beaver Hall Square

Calgary:
325 Eighth Avenue West

Vancouver:
847 Beatty Street

"MADE IN CANADA"

14 Lbs. Pressure downward



AS soon as steam strikes the sensitive corrugated disc, the disc moves towards its seat and exerts a maximum downward pressure of 14 pounds. This force is exerted uniformly by the vaporization of a liquid inside the corrugated disc.

This downward pressure causes the trap to be effective in spite of any grease and foreign matter which might have a tendency to accumulate on the seat.

The DUNHAM HEATING SERVICE

In action, the disc is alternately on and off its seat, depending on the rate at which the steam is condensed in the radiator. Its action is always positive—is never sluggish—and can be depended on under conditions varying from 10 pound pressure to 15 inches of vacuum. Passes all water; wastes no steam.

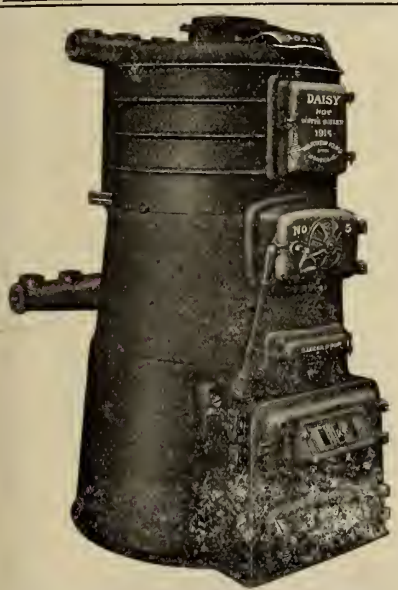
Write for complete details.

C. A. DUNHAM CO., LTD., TORONTO, ONTARIO

Halifax Ottawa Vancouver Montreal Winnipeg Calgary

London: 64 Regent House, Regent Street, W. i.

Over 60,000 Daisy Hot Water Boilers Now in Use—Are *You* Selling Your Share?



Daisy Hot Water Boilers are easiest to sell because they have an established reputation for exactly meeting the requirements of the modern home.

Every Daisy you instal will help build bigger business by bringing repeat orders for installation in neighboring homes later.

WARDEN KING, Limited, Montreal

BRANCH OFFICE: 136 SIMCOE ST., TORONTO

The Canadian Society of Domestic Sanitary and Heating Engineers

PRESIDENT
Frank R. Maxwell, Toronto

VICE-PRESIDENT
Harry Mahoney, Guelph

SECRETARY-TREASURER
Garrett F. Frankland, Toronto

Why You Should Join The Canadian Society of Domestic Sanitary and Heating Engineers

Because as a Canadian citizen, it is your duty to

YOUR COUNTRY,
YOUR COUNTRYMEN,
YOUR CRAFT,
YOUR FAMILY,
YOURSELF.

FIRST—Your duty to your country, to make it the best place in the world to live in.

SECOND—Your duty to your countrymen, to assure them the highest standard of sanitary plumbing, heating and ventilating systems in their homes and buildings.

THIRD—Your duty to your craft, to assure the highest standard of business methods and principles for the Domestic Sanitary and Heating Engineers throughout the Dominion of Canada.

FOURTH—Your duty to your family, to assure them every comfort and pleasure that rightfully belongs to them.

FIFTH—Your duty to yourself, to assure the honor and respect that is your due from the world as a capable and successful sanitary and heating engineer.

That is what the Canadian Society of Domestic Sanitary and Heating Engineers stands for. Are you with us? If so, forward your name at once to the Secretary. Remember, we are ALL FOR ONE and ONE FOR ALL.

Thanking you for your co-operation,

FRANK R. MAXWELL, President

Address all Communications to
GARRETT F. FRANKLAND, Secretary-Treasurer,
Room 303, 22 College Street, TORONTO, ONTARIO

OPERATING COST SHEET OR FIXED CHARGE

Computed From Actual Figures Obtained From 762 Successful Plumbing and Heating Shops Tabulated for a Growing Business

Item	Column	A	B	C	D	E	F	G	H	I	J	K	L
1	Total Volume of Business for year	$5,000	$7,500	$10,000	$15,000	$20,000	$25,000	$35,000	$50,000	$75,000	$100,000	$150,000	
2	Capital Invested	500.00	750.00	1000.00	1500.00	2000.00	2500.00	3500.00	5000.00	7500.00	10000.00	10000.00	
3	Borrowed Capital	250.00	425.00	675.00	850.00	1000.00	1500.00	2000.00	3000.00	4000.00	4000.00	5000.00	
4	Interest on Capital	30.00	45.00	60.90	90.00	120.00	140.00	210.00	300.00	450.00	600.00	600.00	
5	Interest on Borrowed Money	15.00	25.00	40.00	50.00	60.00	75.00	100.00	150.00	200.00	200.00	250.00	
6	Taxes—(*Rate $3. per $100*)	13.50	21.15	30.15	42.30	54.00	72.00	99.00	144.00	207.00	252.00	270.00	
7	Rent—(*about 2 per cent.*)	120.00	180.00	240.00	300.00	480.00	600.00	780.00	900.00	1200.00	1200.00	1200.00	
8	Owner's Salary	200.00	350.00	500.00	1000.00	1500.00	2000.00	2500.00	4000.00	4500.00	5000.00	6000.00	
9	Office Help	300.00	300.00	500.00	500.00	500.00	500.00	750.00	325.00	700.00	850.00	2000.00	
10	Foreman	.....	.....	.....	.....	.....	.....	1250.00	.....	1250.00	1250.00	1250.00	
11	Truck Driver	.....	.....	.....	400.00	500.00	700.00	.....	900.00	900.00	900.00	900.00	
12	Stockman	.....	.....	.....	.....	.....	.....	.....	600.00	1000.00	1000.00	1000.00	
	These five items should represent about 10% of the Gross Business.												
13	Labor Not Chargeable	5.00 *Helper Only*	7.50 *100 days*	10.00 *200 days*	15.00 *300 days*	20.00 *500 days*	25.00 *700 days*	35.00 *900 days*	50.00 *1100 days*	75.00 *1800 days*	100.00 *2200 days*	100.00 *3300 days*	
14	Workmen's Compensation Insurance (*Based on plumber at $5 per day*)	20.00	20.00	20.00	25.40	40.00	44.40	72.00	75.00	142.00	150.00	217.00	
15	Office, Shop and Store Equipment	5.00	7.50	10.00	15.00	20.00	25.00	35.00	50.00	75.00	100.00	100.00	
16	Telephone and Telegraph	65.00	65.00	70.00	75.00	75.00	75.00	80.00	90.00	100.00	120.00	120.00	
17	Light, Heat, Power and Water	10.00	15.00	20.00	25.00	40.00	50.00	50.00	65.00	75.00	100.00	100.00	
18	Oil, Candles, Matches, etc.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
19	Paint, Dope, etc.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
20	Gasoline, etc.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
	These items are merchandise and should be charged to the individual job requiring them.												
21	Expense of Horse	280.00	280.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	
22	Expense of Harness and Wagon	40.00	40.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	
23	Expense of Truck	.....	.....	280.00	225.00	160.00	106.00	28.00	.....	108.00 *2 Trucks*	*2 Trucks*	*2 Trucks*	
24	Insurance on Horse and Truck	2.50	2.50	6.00	9.00	9.00	12.00	15.00	.....	35.00	.....	.....	
25	Liability Insurance	8.25	8.25	64.00	64.00	64.00	64.00	64.00	64.00	128.00	128.00	128.00	
26	Business Insurance	25.00	37.50	50.00	75.00	100.00	125.00	175.00	250.00	375.00	500.00	500.00	
27	Insurance on Stock	3.75	4.75	8.50	11.00	15.00	19.00	26.00	37.00	56.00	75.00	100.00	
28	Depreciation	50.00	75.00	100.00	150.00	200.00	250.00	350.00	500.00	750.00	1000.00	1250.00	
29	Damaged Material	2.00	3.00	4.00	6.00	8.00	10.00	14.00	20.00	30.00	40.00	60.00	
30	Tool Repairs—($\frac{1}{8}$ *of 1 per cent.*)	10.00	15.00	20.00	30.00	40.00	50.00	70.00	100.00	150.00	200.00	300.00	
31	Stationery and Printing—($\frac{1}{8}$ *of 1 per cent.*)	10.00	15.00	20.00	30.00	40.00	50.00	70.00	100.00	150.00	200.00	300.00	
32	Postage	5.00	7.50	10.00	15.00	20.00	25.00	35.00	50.00	75.00	100.00	150.00	
33	Advertising—($\frac{1}{2}$ *to 2 per cent.*)	50.00	75.00	100.00	150.00	200.00	225.00	250.00	300.00	400.00	500.00	700.00	
34	Trade Papers	5.00	5.00	5.00	5.00	5.00	5.00	7.00	9.00	10.00	12.00	12.00	
35	Association Dues—(*Conventions, Soliciting, Buying*)	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	
36	Traveling Expense	30.00	40.00	50.00	65.00	75.00	100.00	150.00	200.00	250.00	250.00	250.00	
37	Good Fellowship and Gifts	25.00	35.00	50.00	75.00	85.00	100.00	125.00	150.00	200.00	350.00	500.00	
38	Incidental Expense—(*$1 per $1,000*)	5.00	7.50	10.00	15.00	20.00	25.00	35.00	50.00	75.00	100.00	150.00	
39	Bad Accounts and Allowances ($\frac{1}{2}$ *of 1 per cent.*)	25.00	37.50	50.00	75.00	100.00	125.00	175.00	250.00	375.00	500.00	750.00	
40	Lawyer	.....	.....	.....	.....	10.00	15.00	25.00	30.00	40.00	50.00	75.00	
41	Collections—(*By the use of Cash Discount and Trade Acceptance, this item is eliminated.*)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
42	License Fee	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	
43	Total of Fixed Charge or Operating Cost	$1400.00	$1764.65	$2368.55	$3577.70	$4600.00	$5652.40	$7435.00	$9679.00	13821.00	15867.00	19372.00	
44	Percentage of Overhead— *To be added to Cost of Labor and Material*	44½%	34 $\frac{9}{10}$%	35⅕%	35½%	33 $\frac{9}{10}$%	33 $\frac{1}{10}$%	31%	27 $\frac{1}{10}$%	25⅜%	21⅛%	14⅛%	
45	Discount—*That can be given from 100 per cent. List to make 10 per cent. Profit*	20½%	25⅛%	25⅜%	25⅜%	26 $\frac{3}{10}$%	26 $\frac{7}{10}$%	27 $\frac{9}{10}$%	30 $\frac{1}{10}$%	30 $\frac{9}{10}$%	33 $\frac{8}{10}$%	37 $\frac{1}{10}$%	
46	Discount—*That can be given from 100 per cent. List to make 10 per cent. profit if 5 per cent. is allowed for cash*	16 $\frac{3}{10}$+5	21 $\frac{9}{10}$+5	21 $\frac{7}{10}$+5	21½+5	22⅖+5	22 $\frac{9}{10}$+5	24 $\frac{1}{10}$+5	26⅖+5	27⅛+5	29 $\frac{8}{10}$+5	33 $\frac{9}{10}$+5	
47	Net Cash Profit for year	454.54	681.81	909.09	1363.63	1818.18	2272.72	3181.81	4545.45	6818.18	9090.90	13636.36	
48	Percentage of Overhead based on Sale Price	28%	23½%	23 $\frac{7}{10}$%	23⅛%	23%	22⅗%	21⅖%	19 $\frac{3}{10}$%	18⅖%	15⅛%	10⅛%	

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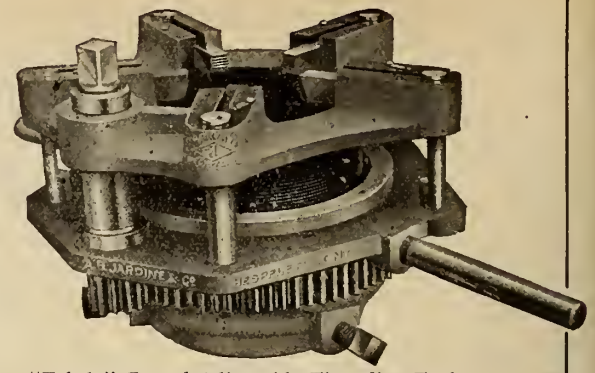
JARDINE and TOLEDO PIPE THREADING TOOLS



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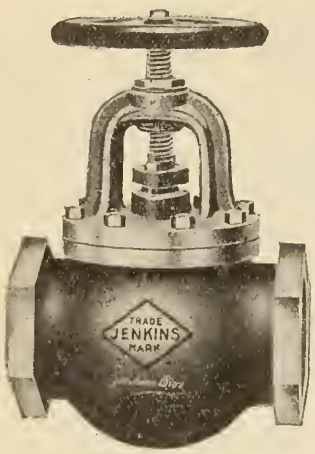

FIG. 141
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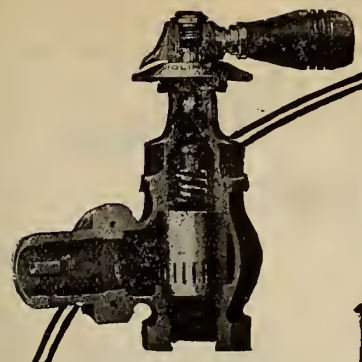

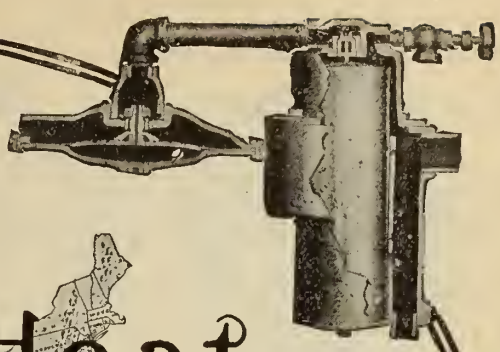

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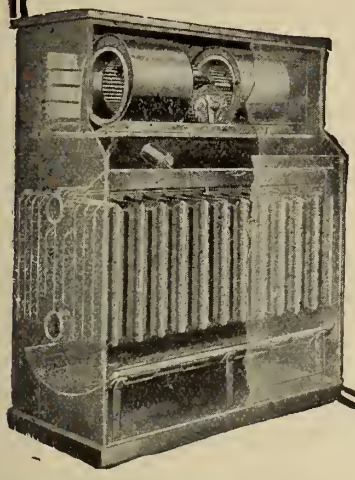

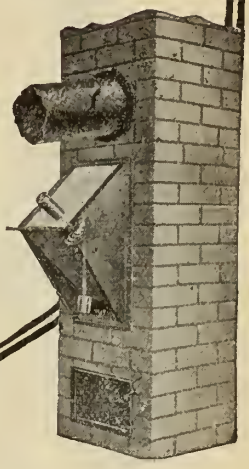

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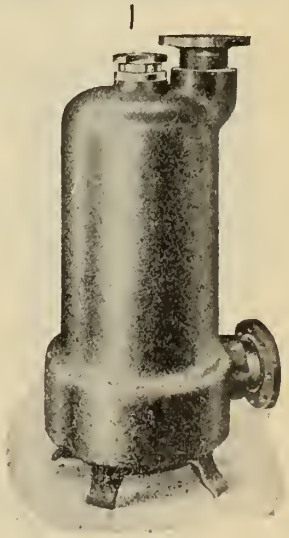

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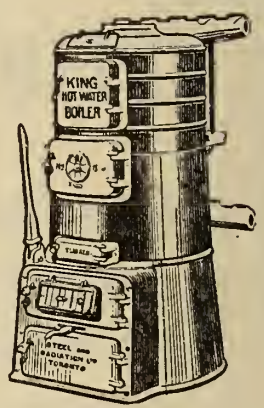

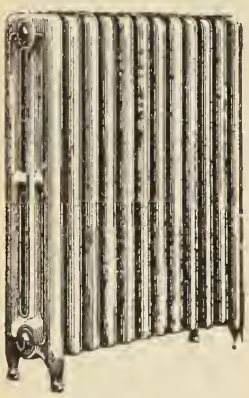

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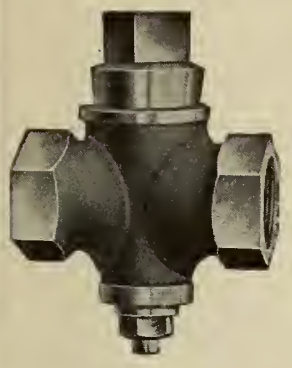

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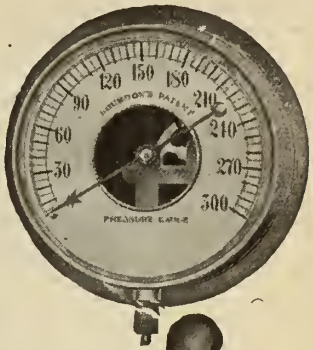

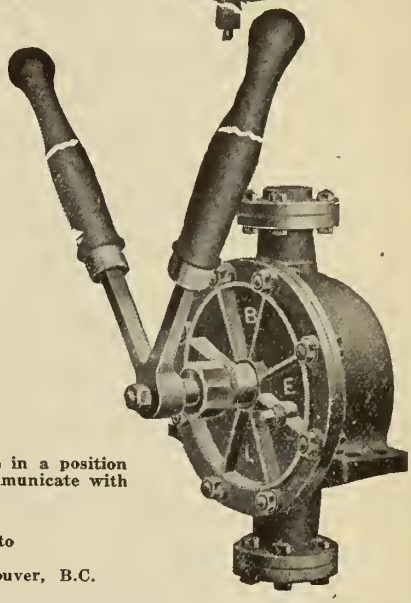

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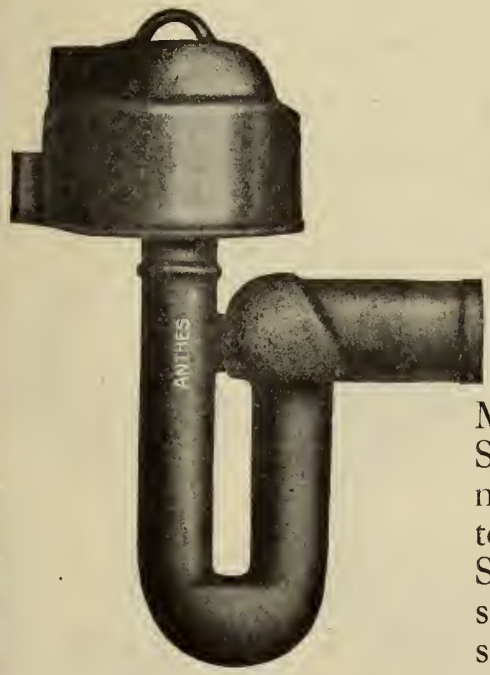

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PLUMBER AND STEAMFITTER OF CANADA

ESTABLISHED 1907 PUBLISHED TWICE MONTHLY

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CONTENTS

Do You Know Your Overhead? 13
How to Make Neat Working Drawings 14
Symbols Used in General Practice 15-16
A New Series For the New Year 17
Do You Keep Accounts Cleaned Up? 18
Profitable Field in Electrical Goods 19
Profits in Metal Construction 20
Why Not Stop Price Cutting? 21-22
Basis For Determining Profits 23
Editorial Comment 26-27
News From Here and There 28-29
Important Ruling Made by Board 30
Directors Visit Galt and Kitchener 31
Heating and Ventilating 32-33
Market Conditions and Tendencies 36-38

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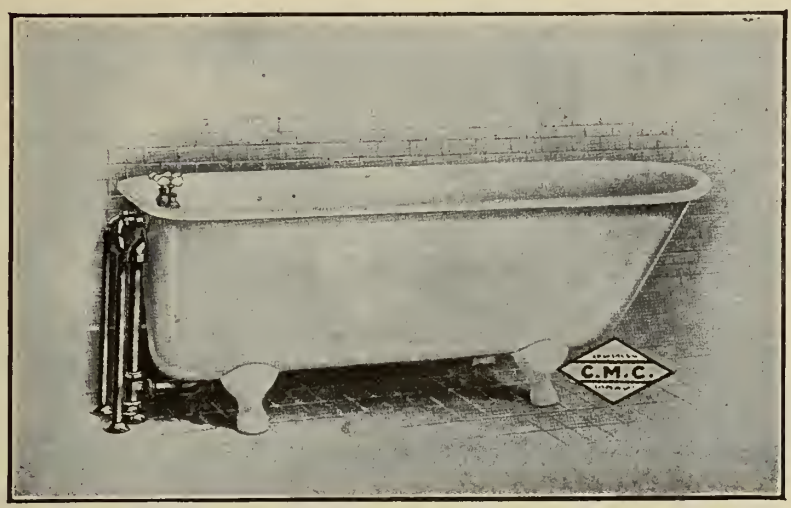

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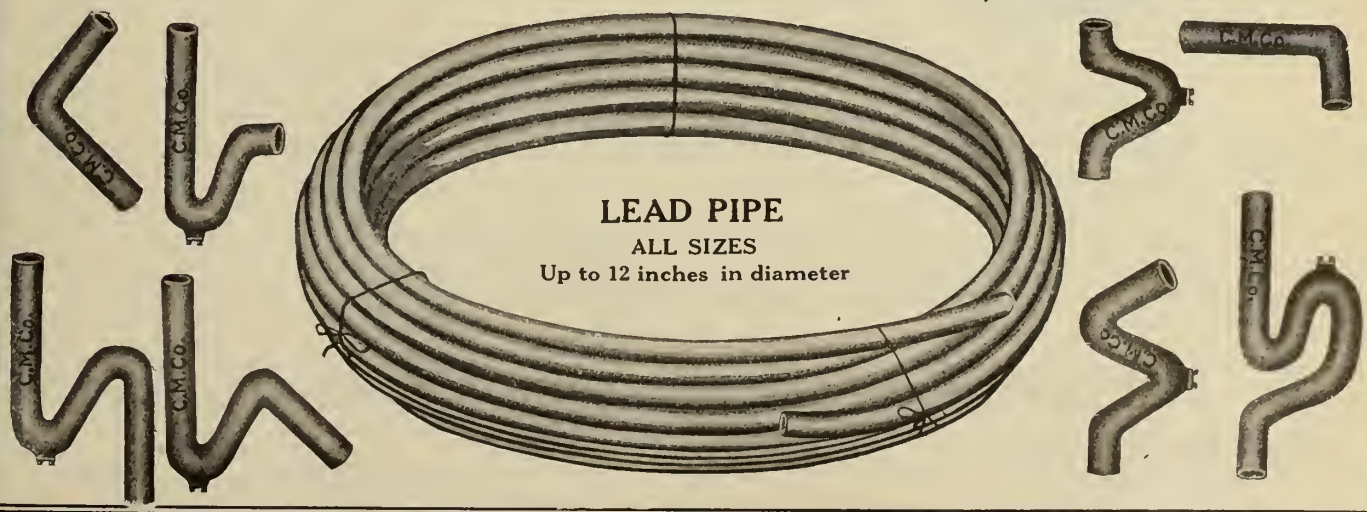

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Published First and Fifteenth of Month

Vol. XIII. TORONTO, DECEMBER 1, 1919 No. 23

Do You Know Your Overhead?

Cost of Carrying on Business Has Been Advancing Steadily. Investigation by Expert Shows That Many Business Men Do Not Know What It is Costing Them to Carry On

SOME figures not only interesting but rather startling are given by Professor Melvin T. Copeland, Director of the Bureau of Business Research, Harvard University, who has been conducting a personal investigation into the cost of doing business. In his report, he says in part: "In practically every instance we found that the stores with a high rate of stock turn were operating at a substantially lower expense than the stores with a low stock turn. Furthermore, there is less loss through depreciation, shrinkage and obsolescence in stores which turn their stocks rapidly.

DO NOT KNOW COSTS

"We also found that many merchants do not know what it is costing them to do business. Frequently we had merchants tell us specifically that they did not know what their total expense was. In the retail grocery trade and in the retail drug trade I judge that probably fifty per cent. of the storekeepers do not take an annual inventory. As regards expenses, I am led to believe that an even larger proportion of retail merchants, have no accurate knowledge of their operating costs. An amusing instance was furnished by a retail grocer who returned the form we sent him with the following statement written across the face: 'I have no detailed records, but my cost of doing business is five per cent.'

OPERATE AT A LOSS

"Even under present conditions when losses are far less frequent than in ordinary times owing to the demand for goods, there are still quite a number of retail stores that are being operated at a loss. We can look ahead to a period of great business prosperity. Yet before we realize that we will have to go through some adjustments. The active demand in retail trade that is now resulting from inflation is particularly unstable. This demand has risen largely from consumers who have enjoyed a sudden, rapid increase in their incomes.

BUYING LUXURIES

"Workmen, for instance, are buying silk shirts and many other luxuries to which they were not previously accustomed. There is an accumulated demand for new homes, yet this demand is not being filled in a great many cases, because prices of building materials and labor are so high. In other words the great demand that we have witnessed in recent months is not primarily the demand that has accumulated during the war, but rather a new demand that has resulted from inflation. Sooner or later the accumulated demand of the last four or five years will have to be taken care of and eventually the process of deflation will help to bring this about."

ARE NOT JUSTIFIED

Discussing business generally, Professor Copeland says, "We have heard a great deal for some time past about profiteering. From careful observations I judge that many of these accusations are unjustified. Business has been very active in most lines and failures have been far less frequent than in normal times. Yet I doubt seriously whether there are more frequent instances of abnormal profits in retail and wholesale businesses than in manufacturing or among wage-earners and farmers.

"All along the line we have seen higher prices, higher incomes and higher expenses. Clergymen, school teachers and college professors are about the only classes who have not had a share in these larger monetary incomes. The dollar has truly fallen in value, but not because of the machinations of merchants and business men.

IN SAME PROPORTION

"My investigations would indicate that the cost of doing business has gone up in retail and wholesale trades about as rapidly as prices and profits have advanced. I have had every opportunity to learn the cost of doing business in many trades, and have been furnished detailed reports. They came from all parts of the country and I am confident that they are fully typical and a fair guide to what is happening.

"To my mind there is unquestionably an opportunity for improvement in the methods by which a large percentage of businesses are carried on."

How to Make Neat Working Drawings

Practical Talks on Draughting for Sanitary and Heating Engineers—Important Series to be Written for "Sanitary Engineer" by Andrew Loucks

THE ability to make clear and neat working drawings is easily acquired. All that is required at the start is the possession of enough patience to carry the student through a few of the difficulties of the art.

We have here called the making of working drawings an art; but except in so far as a good mechanical draftsman has some creative joy in his work, mechanical drafting is not an art in the narrow meaning of the word. The work is entirely mechanical; and any man who has it in him to be a capable mechanic, has also the faculties required for draftsmanship in a high degree.

To those who take up this study, we wish to say, that very often, the discouragement attendant on the use of rebellious tools in hands unaccustomed to the work, is on the point of being dissipated at that very moment when the obstacles appear insurmountable. It is no unusual thing for a beginner in this art to practise hours over an exercise that fills him with disgust; and then, when he is about to throw the tools down, finding a facility of hand and pen that he perhaps had deemed himself incapable of attaining.

Have Taught Themselves

Quite a number of high-class draftsmen have taught themselves to make drawings that are equal to the best work of the more fortunate school-taught men; but in the pursuit of experience they have travelled over a road disheartening to any but those of the toughest mental fibre. To gain skill as a draftsman, one must receive a great deal of what may be well called "negative instruction." To make this a little clearer, we may say that a great—and possibly the better—part of instruction comes in the form of: "Don't do it that way." The self-taught draftsman tries as a rule the fifteen wrong ways of doing his work before he strikes on the one that is right.

In the course which we intend to present, during the coming year, a great many of the "Don'ts" will appear, as well as a number of the "Do's." The short-cuts taken in actual drafting work will also be pointed out.

Of Real Value

Of far more than ordinary value should this course prove to the practical man. It bears no resemblance to the ordinary text-book instructions, because it has been prepared by a practicing draftsmen, and not by a professional teacher. As a consecutive presentation of the fruits of actual experience the information contained in this course should be far superior to the cut and dried rules of standard text-books.

The author of these articles has had enough experience to know how much must be forgotten by the mechanical draftsman who tries to make his drawings in the spirit of the mediaeval manuscript painter. He understands that over elaboration of working drawings is an indication of mental lethargy which finds pleasure in a dreamful niggling with the pencil.

The Draftsman's Goal

Precision with speedy rendering is the goal of every draftsman who is blessed with common sense, and that sensible workman will not cover his drawing with meaningless lines for the purpose of ornamentation. He leaves no line off a drawing that may assist in a rapid reading of the plan; yet always endeavors to reduce the number of lines necessary to the best presentation of the subject.

Starting with the first article of this course, we shall give a description of the tools required; certain recommendations regarding their use, and care; and then we shall go on through simple problems in practical geometry, plan projection, isometric drawings and simple perspective.

In every article we expect to give information that should be of immediate use to our readers.

Projection of Curves

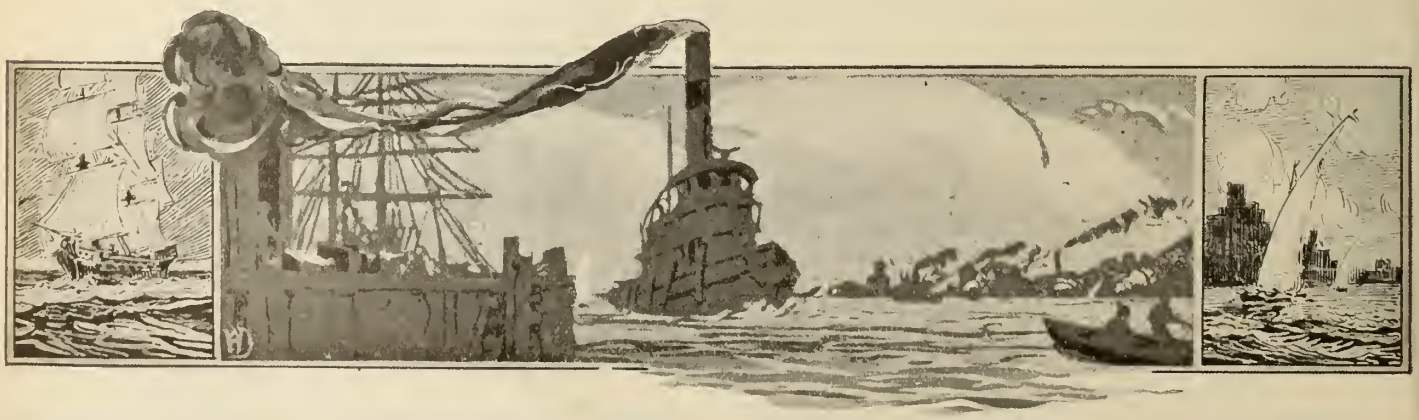
One of the articles will treat of the projection of curves. Any one who reads carefully through that article will grasp at once the principle of pattern drafting. The value of the information given in that article may not be at once apparent to the plumber and steamfitter as of much use in the work where he is more directly interested; yet it is of the greatest value to the man who wishes to be capable of drawing any machine or apparatus.

This course can not be well dipped into at random. It should be taken up at the first article and carried right through to its conclusion.

Pleasure and Profit

We are sure that anyone who follows this course will find it as full of pleasure as of profit. The interest in the course will increase as the student makes a genuine effort to increase his knowledge. With the flight of time there will come to the earnest worker the consummation of his ambitions, and the energy of intense enthusiasm.

Right here we wish to state that no man who loves his sleep more than his work can hope to be a draftsman. The work is not entirely a work of the hands; but also the work of the brain. It requires all that a man may give it of his interests and unless the student is willing to spend hours of his time in its study he would be wise not to make a start on a thing he is incapable of finishing.



Symbols Used in General Practice

Keep the Chart Shown Below for Reference as It May Prove Valuable to You on Many Occasions When Working Out the Details on Some Job—Written for "Sanitary Engineer" by N. A. Kearns

THE object in using symbols on a working drawing is to indicate, in rapid and graphic clarity, such articles, materials or words as the symbols may represent.

Unfortunately, no uniform symbolic code has been adopted by the engineers of Canada, but we, nevertheless, believe that the signs shown on the accompanying chart correspond closely to the usual practice in designations of this nature.

While preparing this list, scores of plans were examined in a search for frequent similarity of delineation, and, as a result of the experiment, we are now placing before the readers of the SANITARY ENGINEER a code that has, at least, the merit of being understood by the majority of plan readers.

A Progressive Evolution

Expressive symbols are a product of progressive evolution, and, therefore, no symbol can be considered as a correct sign unless in some respect it shows a resemblance to its parent root. The necessity for this is apparent when a plan lies before us unaccompanied by an index of the symbols used. If the man who prepares such a plan is unfamiliar with the general practice in indication, he might, lacking such knowledge, still supply a drawing so faithful in pictorial value, that his symbols would approximate those here given.

Are Carefully Chosen

The symbols that are shown on this chart, almost without exception, bear some resemblance to the things to which their meanings apply. So, when no symbol is given for a certain thing, the practice of engineers is to make the drawing of that detail so that its meaning is revealed by its very appearance. It is not long before such a drawing becomes simplified to the lineaments of a symbol with one dominant character.

Ideal Symbols

The ideal symbol is one that means one thing, and one thing only. It must be distinctive, so that its appearance will not become confused with that of some other symbol signifying a different detail.

Symbols must be composed of few lines, so that they can be drawn rapidly. They must be of dimensions corresponding closely to the scaled dimensions of the actual figures they specify.

Symbols for Piping

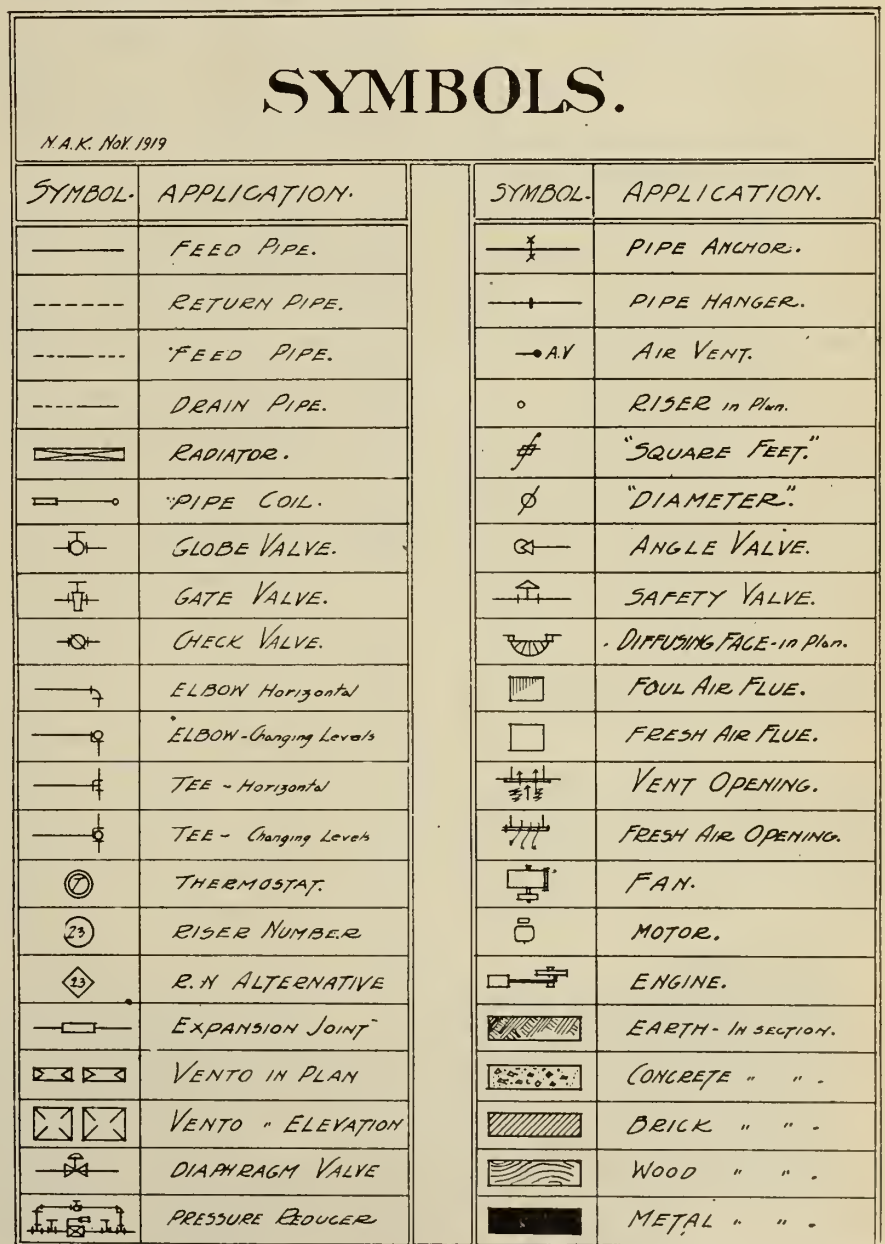
The first symbol on the chart is that indicating a line of pipe. Some engineers indicate feed pipes by double lines. That practice is not one that can be recommended where drawings are made at quarter or one-eighth inch scale. The drawing of a double line is a slow process, that does not add anything to the clearness of indication. Where two or more feed lines are run for different purposes, the lines may be made quite as distinctive by varying their widths, as by the more laborious operation of drawing the two lines.

The single line should be drawn in position corresponding to that of the centre line of the run of pipe.

One sign that may be called a standard symbol is that used to denote return lines. In every plan examined, during our search, the dotted line was used as the standard token for return piping.

Feed Pipe Line

The feed pipe line shown by three dots and the dash, and the drain pipe line exhibited in the four dots and the dash, were only found in this character on



Keep this table of symbols for referenc c. It is valuable and may prove very useful on many occasions. It is worth studying carefully and becoming familiar with.

about one-tenth of the drawings. The other nine-tenths of the drawings were absolutely void of uniformity for this representation.

Radiators

On plans, when only the heating system is shown, radiators may be clearly indicated by a solid filling-in of the area they are to occupy; but when other details appear on the drawings, it is advisable to show the radiators in the way given in the chart. The radiators should be drawn to scale.

It is the usual custom to make a note, specifying radiators thus:

$$2\times10\times38=40 \text{ sq. ft.}$$

The figure 2 stands for the number of loops; the 10 for the number of sections; the 38 for the height in inches; and the 40 for the total area in square feet. The practice of specifying radiators thus, is by no means uniform; but it is the way favored by the majority of engineers.

Valves

The chart shows symbols for valves of different kinds, and we hardly need make any comment in this connection, other than to say that there seems to be some uniformity in the use of the signs given. The reader will note that the valves are not all listed one after the other, but that they are scattered over the sheet. The reason for placing these symbols in such a way will be understood if the chart is used for an index in reading plans already drawn, or as a guide in drawing new plans.

Riser Numbers

The riser numbers are marked on a plan in circles, placed close to the risers referred to. In some cases, the levels of floors, etc., are indicated in the same way on the drawings, and it is then necessary to number the risers as shown by the alternative symbol.

Square Feet

The significance of the symbol for square feet is quite evident by the square and the initial letter.

Diameter

The diameter sign is not used so frequently in heating plans as in general engineering and architectural drawings. It is a sign that saves a lot of the draughtsman's time where he might be called upon to continually write in the word diameter.

Foul Air

Vertical foul-air ducts are generally shown shaded on their upper left angle. This is not a uniform custom, but promises to become so within a very short time.

Vent Openings

Vent openings are shown as on this chart, with the foul air indicated by the feathered arrows.

Fresh Air Opening

The fresh air is shown leaving the opening by curving arrows.

Fan, Motor and Engine

On small drawings, this machinery is roughly indicated by the symbols given. On large drawings, the machinery is always drawn to scaled measurements.

Other Signs

The signs given for earth, concrete, brick, wood and metal, are the signs of almost universal acceptance.

Not All of the Symbols

The chart does not cover all of the symbols used by the heating and ventilating engineers, but it is complete enough to clearly show the principal use of such figures.

Enthusiastic Over Canada's Future

Managing Director of Baldwin's, Limited, Big Welsh Tin Plate Firm, is Looking for Splendid Trade Developments

ACCORDING to information given SANITARY ENGINEER this week by J. C. Davies, managing director of the company, the big new plant being erected in Toronto by Baldwin's Limited, will be producing by July, 1920. Work is being rushed and splendid progress is being made.

The report has been published in some papers that Baldwin's, Limited, intend to work from the ore, which means the installation of blast furnaces and perhaps a coking plant.

Large Tonnages

When asked regarding this, Mr. Davies said, "For the present we intend to operate the furnaces, depending largely on scrap metal, for the turning of which into steel ingots the works are admirably fitted. We will be purchasers of very large tonnages of scrap material, much of which I am given to understand goes out of the country at present. Our decision regarding the installation of furnaces later on to produce our own iron from the ore will depend on the development of the business and the conditions of the market.

Will Help Others

"We believe that the operation of our plant here will be a good thing for numerous other industries, for there are many lines affected by the operation of a plant that is turning out tin plate, and our other lines. Above all else for the present, though, we want to secure the co-operation and good-will of the Canadian people. We want that more than anything. We are taking a big step in coming to Canada, for many of our friends urged us to keep on supplying the trade here from our Swansea plant in Wales. We have taken the big step and we certainly are not going to turn back now.

Sees Good Market

"We expect to put the finishing mill in operation, and then all lines can be turned out. Of course, there is a great forging capacity at the works, as you know, that was utilized to such good advantage in war work. We shall likely use that to turn out some of the heavy castings for our rolling mill. Some of the rest of it we shall secure in United States and some will come from the Old Country. As far as we can see there should be easily a market now for 200,000 tons annually of tin plate, black sheets and black plate (black plate for enamel work), galvanized sheets, etc. We also intend to develop the forging plant."

Future of Canada

Mr. Davies is returning to the Old Country shortly, expecting to sail on the 25th of this month. He is enthusiastic about the future of this country, providing good relations can be maintained between the employers and labor. It is worth noting, in this respect, that the Baldwin plant, which employed at Swansea some fourteen or fifteen thousand hands, had no strikes during the war nor since, and good relations are maintained between the company and its men. It will be necessary for the Baldwin organization to bring to this country a number of skilled workmen, including those who will be in executive capacities.

DUNNAGE ALLOWANCE IS SET BY BOARD

Ottawa.—The Board of Railway Commissioners have given judgment in the matter of special freight tariffs governing the weighing of carload traffic and allowances from track scale weights and cancellation of the allowance of one thousand pounds dunnage in agricultural implements, machinery, stoves, street cars, vehicles in box or stock cars.

The matter came before the Board in Toronto in April, 1911, when the late Chief Commissioner Mabee directed that the effective date of the proposed tariff be postponed.

Commissioner Goodeve, in a judgment concurred in by Chief Commissioner Carvell and Commissioner Boyce, ruled that there should be a dunnage allowance of 650 pounds per car on shipments of the foregoing goods, provided that in no case should less than the established minimum carload rate be charged.

The commissioner also sets forth that he sees no reason why the same rule should not apply also generally to acid in carboys, also to such other articles as may require dunnage protection during shipment.

A New Series for the New Year

Detailed and Practical Analysis of the Important Subject of Heating and Ventilating —Special Articles to be Written for "Sanitary Engineer" by N. A. Kearns

BEFORE attempting to analyze any subject it is always well to first make some effort in a general survey, with the object of finding, if possible, something that might, as it were, strike the keynote of our understanding.

There is an analogy to this in the way we look over a valley to mark how the curving roads follow the landmarks that are plainly visible from the hillside on which we stand.

It is this point of view we have asked our readers to take while we presented the subjects that have so far appeared in this series of articles. The first of January—1920—will mark a departure for new viewpoints. After the present year we shall no longer treat the subject of heating and ventilation in a general way, but rather in detailed analysis.

In Alphabetical Order

When each detail of the science of the heating and ventilating engineer is classified according to the order of the letters in the alphabet, such may be referred to at certain times when specific information may be required. One defect of the arrangement is that certain articles can not be presented properly linked to other articles that have a bearing on the same detail. But even with this defect we are sure that convenience of ready reference will more than outweigh any objection to the apparent disorganization of the subject matter.

No Repetition

It is not our intention to go over ground that has already been covered in the articles of the former series; but there are some elements of the subject that must be brought out in stronger relief and in greater detail than have so far appeared. Such subjects are worthy of the short rehearsal that they demand. We have already written much with regard to the functions of Thermal units, and when again we give a brief *résumé* of what has been presented in detail, the recapitulation will be presented in few words. Perhaps all that may be necessary is to direct the reader's attention back to the data given in the April 1st (1919) number of the SANITARY ENGINEER. But we certainly shall not allow the letter "B" to get past without making some direct reference to the importance of a thorough understanding of the "what," the "why" and the "how" of the B.t.u.

All Subjects to be Treated Fully

Beginning with the letter "A" we shall go through the alphabet, touching on, and treating fully, every item from "Absolute Temperatures" to "zero." From time to time we shall furnish an index indicating the dated appearance of certain letters; so that our readers may find at any time articles in which they are interested.

The Convenience of the Classification

Just at the time of its presentation, a paper may not contain the data that is of immediate value to the reader, but he may find some time later he requires information regarding, say, Anemometers; so he looks under "A" and finds the information desired. Or again, it may be "Indirect Radiators" that he is interested in. He looks under "I" and finds that note is made of this subject under the heading of "Radiators" as listed in the "R's."

Illustrations

The entire series will be illustrated with drawings, or photographs, where such are necessary to clearly convey to the reader the meaning of the text.

Specifications

Under the letter "S", specifications will be analyzed in detail. Clause by clause, different specifications will be examined and we shall point out why certain fittings are used in good work.

Forced Hot Water Systems

These systems are returning to popular favor; so we shall deal at some length with the principles governing, and the details used in, this class of heating work.

Tables

Tables will be given under the letter "T," and references will be made to these tables when subjects requiring tables appear under another heading.

Electrical Notes

There are certain terms used in electrical work that the ventilating engineer should be familiar with. The meanings of the terms will be given, together with such other information as may ordinarily be required by the practicing engineer.

A Partial List of Subjects

Absolute Temperature, Air, Anemometers, Accelerated Systems, Asbestos, Boilers, Belts, Cast Iron, Combination Systems, Combustion, Dimensions (standards), Fans, Fluids (Laws Governing), Formulae, Furnaces, Fuels, Galvanized Iron, Generators, Grates, Gravity Systems, Humidity, Hydrostatics, Joints, Materials, Mixing Dampers, Molecular Theory, Mud, Packing, Pipe, Pressure, Radiators, Registers, Regulators, Rules, Steel, Statics, Traps, Tables, Tanks, Tests, Thermometers, Thermostats, Valves, Vapor Systems, Ventilation, Vacuum Systems, Water, Zero.

The list is by no means complete; but should be sufficient to indicate how varied are the subjects to be covered in this series.

At times a number of subjects will appear in a single issue of the SANITARY ENGINEER. At other times only one detail may be presented, because of the necessary length of the descriptive article.

TO SUPERVISE PROVINCIAL BOARD OF HEALTH

The Ontario Government has taken steps to lighten the administrative burden of the Provincial Secretary, Hon. H. C. Nixon. As a result Hon. Walter R. Rollo is now Minister of Labor and Health in more than name only. He was sworn in as Minister of Labor, but later an order-in-Council was passed transferring to Mr. Rollo's supervision the Provincial Board of Health.

While it was the announced intention of the Government to give Mr. Rollo charge of health matters in addition to those of Labor, it will be impossible to transfer all departments until legislation is passed at the next session. As things now stand Dr. J. W. S. McCullough, Provincial Officer of Health, must serve two masters, for, in addition to having this office, he is also Deputy Registrar-General for the Province.

Do You Keep Accounts Cleaned Up?

Collection is One of the Most Important Features of Conducting a Successful Business —Some Suggestions for Getting After Any Delinquents You May Have

EVIDENCE steadily accumulates that the days of unrestricted credit to customers, especially in the rural districts, are past. Recent statistics show that more and more of the country's business is being done on a cash basis. Many hardware merchants, of course, have accounts with factories, contractors or others where immediate settlement for goods ordered through workmen or others is impossible, but in such cases there is a regular time set for payment and they see that it is not overrun.

People are able to pay and will pay if the retailer lets it be understood that his business is conducted on a system that is more or less strictly cash.

Causes of Failures

More failures have been caused through carelessness on the part of the retailer with regard to his accounts than by faulty methods of doing business. And there are still some customers who defer payment of their legitimate accounts. These are the people the retailer wants to get after, and there is no better time to get after them than right now. The phenomenal success of the recent Victory Loan is an indication that there is an abundance of ready money in circulation; and the retailer is entitled to the account which is due him. If he does not get it, the fault is, possibly, equally between the retailer and the customer.

Afraid to Collect

Many merchants are poor collectors because they dislike "boning" people for money; on the other hand, there are many customers who only need a reminder that an account is due to pay it. But there are also a number of customers who are "hard pay" and with such more strenuous methods have to be adopted.

Personal Touch

A number of methods have been adopted by various merchants throughout the country. Some have inserted advertisements in local papers; others send out letters, while still others make calls for their accounts. In conversation with the credit manager of one of the largest wholesale hardware houses in Ontario, BOOKSELLER & STATIONER was advised that a good policy to follow was to, if possible, give a personal touch to such letters. The merchant, being on intimate terms with his customer, will, in all probability, know some grounds on which he can interject in his letter this personal touch.

Seasonable Appeals

Still another method to follow is to make the letter seasonable. If it is in the spring of the year, state to your creditor, for instance, that it is the beginning of your year's business, that you have many accounts to clear away and that you would apppreciate an early attention to the matter. If it is in the fall, you might say to him that the harvest has been garnered, that the result of the year's effort has been gathered and that you would appreciate his co-operation in cleaning old accounts off your books. This might be carried through the four seasons of the year.

Other methods to be followed are suggested in the following letters. Here is a letter inserted by a Western Ontario merchant on the front page of his home weekly. It is straight to the point and should not give offence to anvone

IT IS DISAGREEABLE

to send or receive an account with a footnote on it such as "Please," "Your kind attention is requested," "Please favor us," etc., etc. Our accounts are never rendered unless they are due. Our terms are, and have been for some time, strictly 30 days (the large Toronto stores do not give one day). Conditions in trade have changed greatly. It now requires nearly double the capital to swing a business. Goods are scarce and difficult to procure. Formerly manufacturers and wholesalers were more lenient in their terms—now the majority of them ask for payment in ten days after the merchandise is shipped (actually before the goods are received, if they are routed by freight). Any thinking person can see the necessity of prompt payment. We ask it in the same courteous manner that we solicit your esteemed trade; both are necessary for our success.

This week upwards of six hundred (600) accounts, running from $3.00 to $300, will be sent out from our office, every one of them due and payable. Many of them are rendered for the first time, many have been rendered many times before. Our experience in rendering the above number of accounts is that abouty fifty (50) of them will be paid promptly—the remainder will have about as much effect as water on a duck's back. It is expected that all accounts leaving our office this week will be paid on or before November 23rd.

We would like very much to carry these four or five hundred accounts for several months if we were strong enough—but we are not.

A Gentle Reminder

Some people only need a reminder in the shape of a letter to bring them into the store with the cash. A politely worded note something like the following will very often suffice:

Dear Mr. ———

Your account is quite a bit past due. We are in need of additional funds and ask, therefore, that you drop in and make some arrangements for paying your account now or as soon as possible.

We do not like to write a letter of this kind to any patron of our store, that you know. We, however, buy for cash and sell on that basis, in order that we may make prices to our patrons that are right. We did to you.

Come in and see us so that we may make some arrangements to settle this account. We will greatly appreciate your doing so.

May we look for you some time this present week? Thank you.

Yours very truly,

A Little Stronger

If this does not bring them in try something a little stronger. Keep right after them. Persistency pays in cases of this kind. Here is a follow-up letter to be sent a week after the first one went out:

Dear Mr. ———

It seems a bit strange to us that so far you have paid no attention to our recent letter asking you to call and settle your past due account.

Our policy has been to buy on a basis of spot cash and sell the same way. We made you prices accordingly, as you know. In other words, we gave you the benefit of spot cash prices and agreed to wait for our "spot cash."

Now, we think you owe it to yourself and us to come in and settle up. We really are in need of the money, as all retailers are at this particular time.

If you are unable to pay in full, we will be glad to have you pay some on account and give us an understanding as to when the balance will be taken care of.

Come in, then, to-morrow or next day, and make arrangements to settle this. Do not disappoint us this time. We shall look for you soon.

We wish to remain,

Yours very truly,

Need the Money

Before taking any drastic action merchants sometimes find it advisable to send a third letter, in which it is intimated that if the party cannot pay the account in full he should come in and at least reduce it. Many of those owing fair-sized accounts will respond to this appeal. A third letter may be worded as follows:

Dear Mr. ———

Here we have asked you twice to come in and make some sort of payment on your old account.

We believe the reason you delayed doing so was because you lacked ready money. So do we.

We need money to carry on our business, and we must, by all means, get it in.

We never like to make trouble of any kind for a patron of our store. When it becomes necessary to do so, he generally loses more than we do. He loses the advantage of cash prices on the goods he gets here, and also loses money and local repute by the law course. We do not want to take such a step now. We say this in all fairness.

Can we, then, depend upon you to square up the old account by the first of the week? Pay at least something on it.

In the hope that you will so favor us, we are,

Yours very truly,

Must Take Action

If all these appeals prove fruitless it means that the party probably does not intend to pay. A fourth letter along the lines indicated below should be sent and the most important point in connection with this is in meaning what you say. It is useless to tell a delinquent you will take action and then never follow it up. It gives him the impression you are afraid. One of the most successful collectors in the country to-day tried all methods of persuasion and appeal before threatening action, but once he says he is going to take the case to the courts he always does so. In this way he has established a reputation for himself that goes a long way with "slow pays." Once they know that R—— has been given the account to collect, they know he means business, and is prepared to go the limit. They also know that if they are temporarily hard up and show by their attitude that they are willing to do the best they can and

Continued on page 35.

Profitable Field in Electrical Goods

Carrying the Stock to Take Care of All Customers' Requirements is a Big Help, Says Sales Manager—Few Displays Can be Made More Attractive in the Store —Steadily Growing Market

THERE is a better and more profitable field for the trade in the sale of electric fixtures and appliances if the individual merchant will be more energetic in making this one of the most attractive departments in his store. This was the opinion expressed to SANITARY ENGINEER by the sales manager of one of the leading manufacturing firms in Toronto. The development of electricity, he pointed out, is increasingly important to the home as well as the industrial life of every community; and the wise merchant has his ear to the ground, so far as the growing requirements of his particular community are concerned.

Varying Opinions

Not a few merchants with whom SANITARY ENGINEER has talked have built up a splendid trade in fixtures and appliances. Opinions seem to vary somewhat as to the procedure to be followed in going after trade. This is to be expected, however, as the needs of various localities are widely different. One man went so far as to say that the sanitary engineer should not go in for the sale of fixtures at all unless he created a department entirely separate from all other departments in his store and put an expert electrician in charge of it. He pointed out the difficulties in connection with assembling the several parts of the completed fixture after it has been shipped by him to the wholesale house; the inability of the average merchant either to wire for the fixture or hang the fixture after he had sold it; and the premium upon his chances of sale because he could not assist the customer to install the fixtures after he had sold them.

Takes Opposite View

This view was not shared, however, by the sales manager of a leading manufacturing firm in Toronto. Experience had taught him, he said, that the sanitary engineer or his assistants were quick to gather and to perfect the details in connection with assembling of parts. His view, in this respect, is borne out by many merchants throughout the province who are carrying on a most successful trade in electrical fixtures. He emphasized the desirability of the purchase by the sanitary engineer of the fixtures, sockets and the glassware,

Electrical fixtures displayed right up at the front of the store have produced splendid business for Kent-Garvin & Co., Ltd., of Hamilton. They make a fine showing at all times, but when turned on at night, the effect is particularly appealing to prospective buyers.

leaving to the expert electrician the whole matter of wiring. It might be impossible for the merchant to carry as complete a stock of glassware as would satisfy the customer; but, by means of catalogues, the most fastidious taste could be satisfied.

Carry the Stock

"Our trouble is to get merchants to carry the stock in electrical goods," said this manager to SANITARY ENGINEER. "They should, I believe, stock more. There is good profit in the sale of all electrical goods. They should sell more than they are selling, and we want them to buy more than they are buying."

He strongly advised the display of all electrical goods, both fixtures and appliances, in a separate department; they should not be mixed up with the other departments of the hardware trade. Few displays can be made more attractive than a display of electrical goods, he said, and frequent use should be made of the windows for such displays. He stated that some merchants were timid about putting in a stock of fixtures and appliances that would let their customers know they were in the electrical business to meet every want of every customer who came into the store.

Business is There

"The business is to be had," said the manager, "it remains with the merchant to interpret the needs of his community and then, with his courage in both hands, open a department, which, with the steady growth of electricity, will soon develop into one of the most profitable departments of his store."

Profits in Metal Construction

Action of the Government of Saskatchewan Will Open Up New Field Which Western Hardware Merchants May Develop to Advantage

THE action of the Government of Saskatchewan in advising farmers in the dry areas to erect supports covered with corrugated iron in order to catch as much precipitation of rain water, snow meltings, etc., as possible, suggests a new channel of trade which the hardware dealer of Western Canada might exploit to good advantage.

The dry areas referred to are very numerous in various parts of the West. The term has reference to those districts in which it is impossible to secure water by the sinking of wells, and which renders it necessary for the farmer so situated to make use of other natural resources available. The best of these is the use of rain water. This source of water supply has, of course, been used for some years by the customary method of placing a barrel under the eaves of the farmhouse and other farm buildings.

Contained Impurities

In most cases these buildings had wooden shingle roofs and the result was that the water secured contained impurities. Another important factor was that shingle roofs did not shed the maximum amount of water due to absorption. The impurities in the water were increased at certain periods due to the fact that particles of sand and soil being carried on the wind easily lodged in the wooden shingles and later found their way to the water barrel.

Iron or Metal Roofing

The logical deduction from the action of the Saskatchewan Government, and from the disadvantages connected with water supply under the circumstances described, is that the farmer should adopt corrugated iron roofing or metal shingles on his house and farm buildings in order to insure an increased supply of purer water than secured under the old conditions.

In this connection it is interesting to note that a sufficient supply of water can be secured from this source, from farm buildings offering 1,800 square feet of roof, to amply supply the average farm requirements. A heavy dew such as is found in many parts of the West in the early fall mornings, will produce half a barrel of water from a surface of 1,800 square feet, providing that surface consists of corrugated iron or metal shingles, and not wooden shingles.

Immunity From Fire

The value of metal roofing is again exemplified in its immunity from fire caused by lightning. The importance of this factor is proved by the fact that in one province alone the monthly loss in barns destroyed by fire from lightning averages close to $100,000. This loss can be practically eliminated by the use of metal roofs on farm buildings. As a lightning arrester a metal roof cannot be improved upon, providing the four corners of the roof are connected with a ground wire.

In many of the dry areas in the Western Provinces farmers and ranchers dig holes in the ground into which the water from rain and snow meltings will run. This water is for the stock. Water secured in this manner is, of necessity, less pure than the water secured from the wooden shingle roofs of the farm buildings, and the practice is likely to result in harm to those using it.

Offers Wide Scope

Having in mind the fact that a metal roof on the farm buildings will provide an ample supply of water for farm requirements, the improvement of the conditions as described offers a wide scope for effective salesmanship work on the part of the hardware dealer in those districts. In the past a good deal of this kind of business has gone to barn framers because the hardware dealer has not been sufficiently active in making suggestions along this line. Dealers situated in districts where this improvement could be adopted to advantage can get the first line on such business in an effective manner by broaching the subject to farmers when visiting the store on other business. Better still for the hardware dealer to pay a personal visit to the farmer at his home and go into the details as affecting that particular case.

Made Good Profits

While it might appear to some dealers that the percentage of profit in this business has not been such as to make it profitable for them to devote time to it, an investigation of the subject reveals the fact that barn framers have been making a substantial profit in this kind of work. An important point to remember is that the goods are not brought into the store and kept on the shelves where their percentage of profit is being steadily consumed by overhead charges. In the case of metal roofing or siding business the material is shipped direct to the customer without any further handling by the dealer. Furthermore, when a farmer gives an order for such material it is not for any small shipment, but one which at the prevailing percentage gives the dealer a very fair profit for his work. This class of business can best be handled by the hardware dealer for his recommendation generally carries more weight with his farmer customers than that of any other trade.

Not Looking For Any Reduction in Pipe Prices For Six Months

ACCORDING to information given to HARDWARE and METAL by the Page-Hersey Iron, Tube and Lead Company of Toronto, the heavy demands for steel, the shortage of the supply due to the big strike in the United States, and the uncertain deliveries resulting from strikes of various kinds across the border, are three factors affecting, to a considerable extent, the output and prices of pipe.

The steel strike, which commenced in the United States some weeks ago, has seriously affected a number of industries which have this as a basic product of their manufactured article; some of the units of this firm itself are idle because of lack of supplies with which to go on. In addition to this, there has been a dislocation of transportation facilities, and this is resulting in uncertain deliveries. Until these conditions right themselves, it is the belief of this firm that there cannot be any appreciable, if any, reduction at all of prices. They do not look for any reduction for, at least, six months.

Are Paying Premiums

As a matter of fact, so SANITARY ENGINEER was informed, premiums are being paid, to a considerable extent, by consumers and contractors for deliveries. While it is the disposition of the manufacturers to hold the prices down, the reasons given above may result in some advances all along the line. This firm, however, does not look for anything in the nature of a runaway market, that is, judging from present conditions, which are affecting the market. The market is standing remarkably firm, and gives no indication of sharp fluctuations one way or the other.

Obtain Supplies

For the benefit of the trade in general, the firm advised that any retailers who are drawing up contracts for work, will do well to obtain their supplies as soon as possible. They do not hold out any inducement that pipes will be any cheaper for some months to come, because of the immediate effect of the steel strike on supplies and the aftermath of an incident that has so upset production all over the country.

Keeping a neat attractive display of bath-room equipment, bath-room fixtures and other merchandise out where it may readily be seen not only by passers-by but by prospective buyers is an excellent means of increasing sales, says C. T. Bull of St. Thomas, Ont. In addition to the display shown above, he has a window display also.

Why Not Stop Price Cutting?

"It is Better to do $400 Worth of Work and Make a Profit Than to Get a $1,000 Job and Make Nothing," Says C. T. Bull, of St. Thomas—Tells of Results He Obtains From Neat Store and Window Displays

"WHAT a lot of men in the plumbing and heating business need to learn to-day, is to cut out price-cutting," said C. T. Bull, of St. Thomas, Ont., in discussing matters of interest with SANITARY ENGINEER. "I know, for instance, of a case where a plumber bought goods for $97 and installed them for $111. There is no sense in that sort of thing. A sanitary and heating engineer is entitled to a fair profit on his work just as much as any other man. It is not a question of getting the job away from some other plumber, although some of them seem to think that is the big thing. I hold that it is better for a man to do $400 worth of business and make a legitimate profit on the work than to do $1,000 worth and not make anything."

Will Not Cut Prices

Mr. Bull says that in his own business, and he has occupied the same shop for twenty years, he figures carefully on all work and allows what he decides is a fair price for good work and good materials. If a prospective customer tells him he can get the job done for a lower figure some place else, Mr. Bull goes into the matter with him thoroughly and shows him just what good materials cost, the allowance for time, etc., and usually he says he can convince the party that he is charging a fair price. In all work he insists upon the customer being satisfied. That, he says, is the sure way to build for future business, as a dissatisfied customer will never stop talking against you, and a pleased patron will come back sooner or later with other work and also send his friends.

Display Gets Results

Mr. Bull says he has found that he gets good results from keeping a store display and also looking after his window. As may be seen from the illustration, the front part of his shop is devoted to a display of enamelware, bathroom fixtures, etc. By having these arranged so that he can bring people who are planning improvements to their homes to his shop and show them the goods and just how they will look in their own house he closes many contracts. Special care is always taken to keep the stock in good condition, as frequently both a man and his wife will come down to look over goods they are thinking of buying, and women particularly do not like to inspect stock that is dusty or not well arranged. On the other hand, Mr. Bull says they are readily interested in an attractive, well kept display.

Recommends New Parts

Mr. Bull does an extensive repair business not only in the city but all out through the country. Whenever he is called to look at a job, if he finds that the part is worn out and is likely to give trouble he recommends that a new piece be put in.

"It is the best plan," he said. "If I were to fix up an old part that was done for it would only be a matter of a short time before it would break again. The customer would naturally be disgusted at having to pay a second bill so soon. He would blame me for not telling him and would probably not have anything more to do with me. If, however, I explain to him that a new part will cost very little more than the repair, and that he will then have a brand new part that will give years of service, he usually sees the point and appreciates my recommendation."

Is Kept Very Busy

Although Mr. Bull finds that many people are holding back new work in the hope that prices will sooner or later be lower, he is kept very busy. Farmers are doing a good deal, he says, in the way of improving their homes, putting in new heating systems, water pressure systems, bathroom equipment, and so on. The farmers, he says, are good buyers. That is they are willing to pay a reasonable price and want a good quality article. The same applies to people generally. Mr. Bull says that most of them know that they will have to pay much higher now for "cheap" goods and would much rather pay a little more and get something worth while.

Has No Apprentices

He has no apprentices because he cannot get them. Boys nowadays, he says, are lured away by higher wages to some

other line and do not want to learn a trade apparently.

"The apprentice problem is a serious matter for the trade as a whole," he said. "If we do not get any boys to learn the business it is only going to be a matter of time before the older men are gone. The plumbing business is a good one, and offers many opportunities. There is no subject of more importance than public health, and no one is more closely connected with it than the sanitary and heating engineer. This fact is not always appreciated; not only by the boy who might be interested in learning the trade, but by the general public. Comparatively few people realize how dependent their health and comfort is upon the work of the plumber."

Inspector is Needed

There is no plumbing inspector in the city of St. Thomas, and in the opinion of Mr. Bull one is needed.

"A plumbing inspector is needed in a good many of our cities and towns," he said. "It is to be regretted that there are not men to protect the interests of the public and prevent a lot of inferior work. Plumbing work is too important to take chances on, and yet a lot of work that should not pass is done simply because there is no action taken to stop it."

Uses Telephone

Mr. Bull says that he finds that a very large percentage of business nowadays comes in over the telephone. He gets calls not only from all parts of the city but from miles out in the country from parties wanting information about repairs, new work they have in mind, and prices of bathrooms or other equipment. He always gives these calls close attention and aims to give quick service. People, he says, appreciate prompt attention and it brings them back again, especially if they are well satisfied with quality of work done.

Non-Shipment of Coke May Cause Foundries to Close

No Reserves in Stock and the Situation is Causing Considerable Anxiety in Many Quarters—Coal Shortage Not Causing Any Immediate Danger

IF the bituminous coal strike in the United States is prolonged for any length of time, there is grave danger that many of the foundries throughout Canada will be compelled to close down until the situation is relieved. The non-shipment of coke from the United States into Canada is aggravating this situation rather more than the scarcity of bituminous coal, as coke is largely used for moulding purposes. There are some foundries engaged largely in the turning out of car wheels, and large quantities of coke are used for this purpose.

Coke Supplies Small

Unfortunately, users of coke in Canada have been living on a hand-to-mouth policy, and they have practically no reserve of coke on hand. Manufacturers who use bituminous coal are more fortunately situated, though inquiries reaching the Manufacturers' Association and the Fuel Controller are multiplying from these sources in which some anxiety is expressed with regard to the future. No bituminous coal has come into Canada in any considerable quanties for over a month; and though many of the manufacturers seem to have sufficient supplies to do them for from one to three months, they are becoming somewhat apprehensive that their situation beyond that time may develop unfavorably if the strike on the other side of the line is not settled and production again commences on a large scale to make up for the time that has been lost.

May be Released

The coke situation, however, is threatening the foundries to a considerable extent. Word that 150 cars of coke are to be released for distribution in Canada is encouraging, and if this is done, there will be a temporary relief. It is believed that this coke will be distributed according to the immediate needs of the several foundries dependent upon coke for their output. Some time ago the Manufacturers' Association sent out a letter advising manufacturers how they could secure coal if it were absolutely necessary. Advantage has been taken of this assistance in the case of coal, and now that foundries have been threatened, at least one foundry has already applied for information which would help him to secure needful supplies.

On the whole, there is a growing anxiety over the situation, though there seems to be no immediate danger of a dislocation of industry on account of coal shortage.

From one who knows.
Gale in Los Angeles "Times."

OPERATING COST SHEET

An operating cost sheet which should prove of much interest to the men in the trade will be found on another page, being featured in the advertising space of the Canadian Brass Co., Ltd., of Galt, Ont. The figures were obtained, it is stated, from actual data secured first hand, and as such have a value for the business man much above that of average statistics. The table is worthy of close perusal.

Basis for Determining Profits

Statement Submitted to Board of Commerce by the Provincial Board of the Retail Merchants' Association of Canada

AFTER going very carefully into the question of "the Basis for Determining Profits," in an effort to remove the many false impressions which have been created in the mind of the public by sensational and unfair inferences drawn by the daily press from investigations, the Manitoba Board of the Retail Merchants' Association of Canada, Inc., has submitted the following to the Board of Commerce:

The retail merchants regard the establishment of the Board of Commerce with satisfaction, and welcome the opportunities it affords for fair discussion of merchandising problems. The advances in prices of all commodities, particularly foodstuffs and other necessaries of life, during the past four years are without parallel in the history of retail trading. They represent to a considerable extent the increases in the cost of living from which the unsettled conditions of the present time largely arise.

General Impression.

There seems to be an impression, in the minds of some people at least, that the retail merchant is responsible in an unwarranted degree for these advances, that he is now and has been making more than a legitimate profit during these times of high prices. The investigations being conducted by your Board at the present time are for the purpose of determining whether this is so, and if so to devise a remedy. As representing the retail merchants of Manitoba we welcome this investigation, and if profiteering among the retail merchants in Manitoba or any other place be found, we shall in every possible way assist you in curbing the profiteering and in punishing the profiteer. But neither your Board nor the public can come to a just conclusion unless all the essential facts are presented to you. It is because we believe that these are not being presented to you, and because of the misleading way in which even the material presented to your Board reaches the public through the newspapers, that we desire to supplement the detailed evidence, which you have obtained and will obtain, by this somewhat formal statement. We believe that we are asking only what is fair when we suggest to your Board that in future examinations of witnesses in connection with retail merchandising you should see that evidence is obtained on all points essential for not only your Board, but for the general public, in coming to a fair conclusion.

Retail Quotations

The public's knowledge of prices and values is almost solely confined to the retail quotations. As a rule they do not consider and are not aware of all the elements that necessarily enter into the determining of the retail prices of goods.

The public is prone to consider as profit either the difference between the retail price and the invoice price, or the difference between the price which the consumer pays to the merchant and the price which the merchant pays to the wholesaler or manufacturer, without taking into consideration the numerous other elements which enter into the cost of the goods to the merchant and all of which must be added, such as freight, rent, wages, insurance, delivery, paper, twine, interest, losses on unsaleable goods, etc., etc.

Not Given Fairly

We do not say that your Board will not give consideration to these facts, but we do believe that in the evidence so far submitted these factors have not been placed before you as fairly and fully as their importance warrants, nor in such a way as to enable the public who read the reports of your proceedings to judge fairly the relation of the retail merchant to the present high prices. If any of the remarks which we have made or may make should appear to criticize either the evidence which has been obtained or the method of obtaining it, the reason is not that we are desirous of being critical, but we are desirous of seeing that the case of the retail merchants is presented fairly and fully to you and the public. Looking at the matter from that point of view, that is, from the point of view of having the evidence as to the retail merchants' relation to the high prices presented fully, we believe we have reason to complain. The evidence so far obtained and the method of obtaining it have been defective in these respects:—

Confused the Prices

1. In the confusing of the marked price with the ultimate price at which the goods are sold.

2. In considering as profit the difference between the invoice price of a particular article and the marked price of that article, instead of considering as profit only the difference between the cost to the merchant of the article up to the time it is delivered to the customer, and the price which the customer pays for it. What is really the only true way of measuring profit is by finding out the difference between the total cost to the merchant of all articles sold during a given time, such cost including every legitimate charge of doing business, and the total price which he receives for the goods sold during that time.

Was Not Considered

3. In not considering as part of the cost of the sold goods such items as freight, insurance, interest on the cost of goods, interest on moneys spent in equipment and furnishings, depreciation of equipment and furnishings, rent, taxes, wages, cost of paper, twine and other accessories, stationery, etc., advertising, cost of draying and delivery, cost of collection of accounts, bad debts, etc., as well as the probable quantity of goods which must be sold below the marked price. All of these must be paid by the merchant and are as much a part of the cost of the goods sold as is the invoice price, or price paid to the wholesaler or manufacturer, and all of them must be taken into account by the merchant in fixing his marked price. The charge of profiteering should not be made or suggested against any merchant unless all of these additional factors have been examined and taken into account.

Unfair Inferences

The confusion of terms that surrounds the discussion of profits is responsible for most of the unfair inferences that have been drawn by the public from the investigations by your board. The principal subject of interest is the profit, and various conclusions are reached as to the amount of this profit. We beg to point out that there is only one kind of profit in business, and that is net profit. What is erroneously described as gross profit includes the expense of transacting business. No corporation or firm can ignore operating costs when calculating its net earnings.

Question of Profit

Reverting to the question of profit, it is evident that a sale price must be established before the dealer can determine his net earnings; in other words, an actual sale must take place. No great amount of economic argument is required to prove that the price established in a sale must be made up of three factors—invoice cost of merchandise, cost of doing business, and net earning or profit. For convenience of discussion, let us consider these as "A," "B" and "C" respectively. "A" is the price at which the goods are supplied by the manufacturer or jobber, and, of course, it is not under any control by the retail merchant. "B" includes all the items that enter into the cost of handling the goods from the time they leave the manufacturer's or jobber's hands until the sale of them (by retail) is completed. It is only partially controlled by the retail dealer, because the public under the competitive system of merchandising now obtaining demands the utmost in service. The difficulties in this connection are increased, too, through the growing tendencies of outside organizations to dictate methods and terms to merchants as employers. "C" is determined solely by the selling price, and is therefore controlled absolutely by the retail dealer. It constitutes his return on the transaction involved in the sale of the goods. Let us repeat here that there is and can be no return until the goods are actually sold.

The Selling Price

It follows as a matter of course that the selling price is made up of "A" (invoice cost—uncontrollable) plus "B" (cost of handling goods and transacting business—partially controllable) plus "C" (merchant's return or net earning—controllable). Under normal circumstances this state of affairs prevails, and the three items may be segregated. In our opinion the only fair method of determining net earning or profit is to ascertain the relation or ratio of "C" to the sum of "A," "B" and "C" in a series of transactions covering a definite period. It is only when "C" is examined in this light that anyone can form an opinion as to whether the profit is excessive. In other words, a charge of profiteering or unjust dealing with the public can be sustained only when it is shown conclusively that the proportion "C" bears to the sum of "A," "B" and "C" is unduly large.

How It Works

For example, suppose a merchant buys one hundred pairs of boots, paying the manufacturer at the manufacturer's place of business $10 a pair, and marks them for sale at $15 a pair. If only these two factors are considered there would be an apparent profit of fifty per cent. on invoice cost. If the information goes to the public in this bald fashion some at least of the people draw the inference that the retail merchant is making the profit of fifty per cent. At any rate there is the suggestion, and too often the inference, that he is making an unreasonable profit, that he is contributing unduly to the high cost of living, and that he is a profiteer. Before the merchant can establish the price at which he proposes to mark the goods he must take into consideration all of the factors which have been mentioned, and probably many others.

Must Pay Interest

In the first place he will have to figure paying interest on the money with which he has bought the goods, because, as you are aware, the banks do not loan money for mercantile purposes without charging interest. He will also have to pay the freight on the goods, and, if they are bought outside of Canada, the duty as well. He will have to pay also cartage on the goods from the station. He will also have to charge against these boots—every pair of them—a proper proportion of all his other expenses of doing business, that is to say, rent, light, heat, interest on the cost of his furnishings, depreciation in stock-in-trade, wages, paper,

Continued on page 34

REGISTERED TRADE MARK

SUPERIORITY PURITY DURABLE AS THE PYRAMIDS

Port Hope Sanitary Plumbing Ware

Every Fixture is unconditionally guaranteed and bears our label as a protection for you and your customers.

THE "CANTERBURY" LAVATORY

You can carry your store in your pocket!

Are you helping the home-builder select his bathroom equipment by placing at his disposal a catalogue of up-to-date sanitary fixtures?

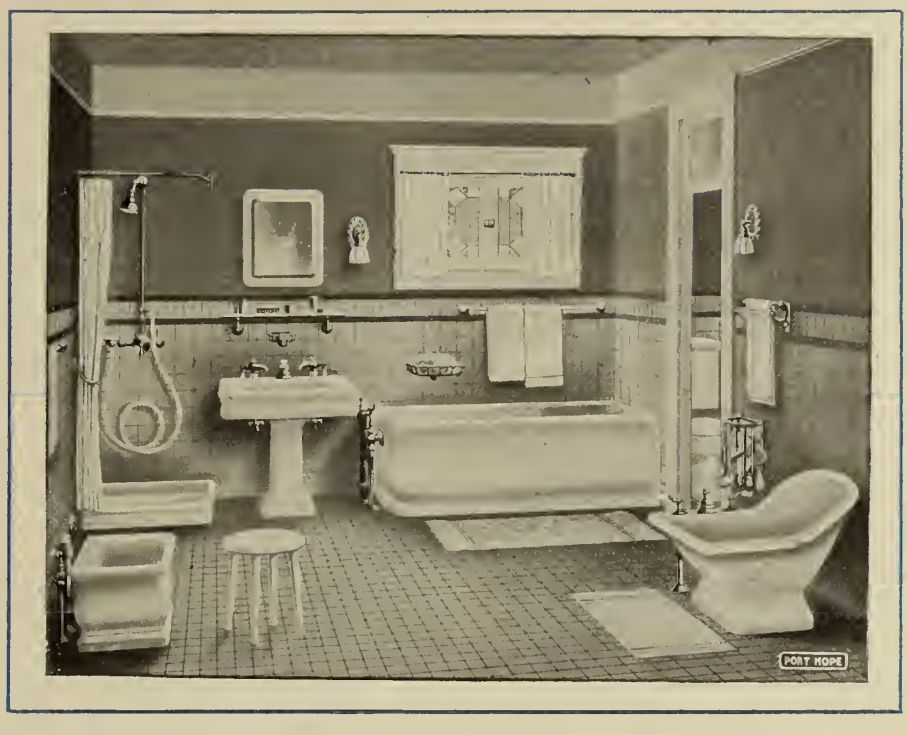
You may not be able to carry a complete stock of enamelled goods in your store.

That is no reason why your customer should not see the best and widest possible selection of bathroom fixtures on the market.

You can carry your *goods in your pocket* and call on your customer. He knows you can do his work to his satisfaction but he doesn't know the work he wants you to do because he is in a quandary about the best kind of fixtures for his new bathroom. Let us help you help him.

Our booklet can be had for the mere asking.

REGISTERED TRADE MARK



Bath Room—Plate "A"

From Page 5 "For the Home" Catalog

Plate
F. 061—5-foot "Pembroke" Bath, with fittings.
F. 077—Alexandra Lavatory, with fittings.
F. 043—Alexandra Receptor, with Shower and Curtain.
F. 88—"Isis" Sitz Bath, with fittings.
F. 035—"Alexandra" Foot Bath, with fittings.
F. 603—Closet Combination.
F.7313—18x28-inch White Enamel Frame Mirror.

Plate
F.3630—30x5-inch Opal Shelf.
F.4045—Soap Dish.
F.4502—Towel Basket.
F.1724—Towel Bar for Sitz Bath.
F.4237—Sponge Holder.
F.3636—Towel Bar for Bath.
F.2504—Bath Stool.

Port Hope Sanitary Mfg. Company, Limited

Factory:
PORT HOPE, ONTARIO
TORONTO SHOW ROOMS
119 King St. East

WINNIPEG OFFICE
405 Tribune Bldg.
HALIFAX OFFICE: McCurdy Building, Hollis Street

Head Office:
ROYAL BANK BUILDING, TORONTO
MONTREAL SHOWROOMS
234 Beaver Hall Hill

EDITORIAL COMMENT

EDITORIAL BRIEFS

WHEN you lose a sale don't think what was wrong with the prospect. Try to figure out what was wrong with you.

* * *

THE man who waits for something to turn up very often finds that his competitor has turned up something while he waits.

* * *

MOST folks used to shine their own shoes, whereas recent figures show that $1,359,576 is paid out each year now to Greeks and others.

SPENDING FOR COMFORT

THE man who is making money—and the working man who is not making good money is the rare exception to-day—is spending a larger share of it than ever before on things that will make life easier for him and his home more comfortable. He has seen electric lights in the home of a friend and he knows that the friend would not be without them, so he plans to get them too. His wife probably has an electric iron and has seen an electric sweeper in action while out somewhere and she will never be satisfied until she gets away from the sweat and dust of old-time methods of sweeping. Or perhaps it is a hand power washing machine she wants, or a water power, or an electric machine. At any rate, it is something that is going to make life easier and pleasanter for her. Very often they are both agreed on some such improvement as modern plumbing or new bathroom fixtures. It is just such cases as these that account for the enormous demand for merchandise at the present time, a demand which is taxing the capacity of manufacturers to keep up with. Instead of growing less this demand is going to be greater, because just as soon as men and women learn about the things they have been going without there is going to be no stopping until they get everything that is within their reach. Once they get electric lights and an electric iron in their home they are going to want other electrical goods. Once they get water installed in the house, it is only a question of time before they will have other conveniences. Once they see how well a nicely painted room shows up, it is only going to be a short time before the whole house is gone over. And so it goes. No merchants in the country are in a position to supply so many of these needs as the hardware merchant and the prospects for business were never brighter. This is just as true of the merchant in the small country village as in the large city. The people are finding out that they have the money to buy the things they would like to have and they are going to have them.

SOLVING THE HEATING PROBLEM

NECESSITY is the mother of invention and it is interesting to note what is happening by those who, faced by a great and growing shortage of coal, are trying to work out some plan for heating. The town of Renfrew has carried a by-law to expend $25,000 on a central heating plant for the business section. The town of Owen Sound, it is stated, has under contemplation something along the same line. New York is undergoing a remarkable transition in regard to heating and from a huge coal burning centre is being turned into an oil burning city. Many of the huge sky scrapers will be kept warm this winter by heat obtained by burning oil. Not a few power companies have started installation of equipment which will enable them to burn oil instead of coal. The whole problem of heating has, owing to coal shortage and strikes, assumed an acute stage which has resulted in efforts being made to try new plans. One of these days we may wake up to find that coal is really not the best or most economical fuel for heating. Predictions are being freely made that this will be the case.

THIS HARD-TIMES TALK

A YEAR ago, after the signing of the Armistice, there was a feeling in Canadian business circles that something in the nature of an industrial crash was impending. The only way to evade idle plants that could be seen was by getting export orders to replace munitions output. What few or none foresaw was the fact that with short working days declining production, and a prosperous people willing to spend from their war-time savings there would be a home market for practically everything which the majority of our plants could supply. To-day Canadian manufacturers are developing a market in Britain and Europe for those products which are largely made from our raw materials, but in many other lines there is, at present, a market at home for everything that can be turned out from the available

raw materials, and at prices providing a good margin of profit.

That present conditions will continue is not to be expected. Public men like Premier Drury have, with commendable frankness, sounded a warning as to the necessity for production and thrift, and the U.F.O. leader has been candid and emphatic in referring to lower prices. The Toronto *Globe* goes so far as to talk of a "hard times" serum to "bring the world's pulse back to normal."

That there must be a process of deflation before Canada and other countries which have been engaged in the great war can reach a solid foundation upon which to build permanently for the future is something which SANITARY ENGINEER has long regarded as inevitable, although from time to time it has been postponed. This readjustment will, no doubt, be accompanied by a strain upon the economic and social fabric of those countries which are suffering from a serious shortage of commodities as well as depleted financial resources and the domination of radical leaders. But at the same time we believe that if there are hard times in Canada it will be largely the fault of Canadians. The world is short of foods and commodities. Canada has the raw materials and available agricultural areas. If we can produce efficiently there is a market waiting. And if we are thrifty we can afford to extend credits to those countries worthy of our confidence. The Bolshevik element must be held in control.

The success of the Victory Loan established the solidity of Canada's financial resources. The people have done their part. It will now be for the Government to do its part. The money has been provided to clean up the situation and to get the national machinery back to a normal basis. It is for the Government to do just that. At present the national expenditures are far above income. If they continue on this basis there is nothing in sight but another Government loan a year or so hence despite rather indefinite assurances to the contrary.

It is to be hoped that Ottawa will not take advantage of the loyalty and generosity of the Canadian people to continue extravagances which must sooner or later be curtailed—and the sooner the better. If the people are to successfully readjust their personal affairs an example must be given by the Government.

BOOSTING HOME TRADE

FORTUNATE indeed is a community whose business men advertise wisely and liberally, says a bulletin from the Associated Advertising Clubs of the World, for that community will grow and prosper.

Good advertising, which means steady advertising in space big enough to tell the story that the advertiser wants to present, brings new dollars to town, and keeps home dollars at home, the bulletin continues.

And what becomes of the dollar that goes into the cash drawer of a local merchant? Three-fourths of it or thereabouts (depending somewhat on the line of business and the nature of the goods sold) goes to the wholesale dealer or manufacturer for the goods the store sells.

The rest stays in the home town. Most of the other twenty-five cents out of each dollar goes for rent, salaries of employees, and to the local coal dealer, the light company and others whose goods or services are needed in keeping the store going.

Each time the advertising of local merchants brings $10,000 of new business to a town, at least $2,500 of it remains in the town, and is passed around from person to person, and all the people share in the resulting prosperity.

Though some people who are not themselves in business fail to appreciate it, everyone in a community has an interest in every new dollar that is brought to town, and that is just as true in the large city, where business is a great net-work of mutual interest, as in the smaller place, where it is easier to trace the benefits which every person receives.

Advertising has come to be a great power in business because advertising creates markets. Markets are in the minds of people, and can be made through honest advertising. Merchants and manufacturers have found that out, and that is why they advertise.

STABILIZING THE DOLLAR

THE appointment of a committee of bankers and business men in the United States to investigate and see what can be done to "stabilize the dollar" is timely. For a long time the decline in the purchasing power of money has been arresting the attention of business men. They realized thoroughly that the time must come when a stop would have to be made or serious disturbances in both economic and industrial relationships would occur. Obviously this condition has arrived. It is not nearly as acute in Canada as in the United States, but because of the close relationship between Canadian and American business men, Canada is very directly affected by conditions which obtain across the line. Investigations so far indicate that the situation has been brought about largely because a paper or credit dollar has driven both gold and silver practically off the monetary stage. Not only America, but practically the whole world, has got off the gold and silver basis and is working largely on paper. Added to this is the fact that throughout the world there is an acute shortage of goods. The problem the investigators have to solve is anything but an easy one in that they have to find means of granting credit and at the same time removing credit inflation. Having diagnosed the case some of the brainiest men in the commercial world of the United States are busy figuring out the best remedy to apply.

News from Here and There

CONTRIBUTIONS OF NEWS GLADLY ACCEPTED

New Firms

O. Galarneau & Son, plumbers, have been registered at Montreal by Ovide Galarneau Jr.

H. E. Trafford & Co., plumbers, has been registered at Montreal by Henry E. Trafford and James H. Trafford.

Personals

Frank R. Maxwell, of Toronto, president of the Dominion Society of Domestic, Sanitary and Heating Engineers, will be a candidate for aldermanic honors in Ward 7 in the coming elections.

Thomas Ferguson, of 2531 Yonge St., Toronto, is seriously ill at his home with pleurisy, which developed after a heavy cold. At last reports Mr. Ferguson was showing improvement.

Trade Notes

In the big gale that swept over the country on Sunday night the roof of the Ontario Sewer Pipe Co.'s factory at Mimico, Ont., was blown off, causing a loss of from $3,000 to $4,000.

STOWE-CRACKNELL

The wedding was solemnized at Newman Hall, Toronto, on Thursday last of Miss Florence Stowe of Goderich, Ont., and Mr. John Cracknell, of the plumbing firm of Kelly and Cracknell. Mr. and Mrs. Cracknell will reside in Toronto.

MAY EXPEND $2,000,000

Windsor, Ont.—Plans of the Essex Border Utilities Commission to consolidate the waterworks sytem of Windsor and Walkerville to supply the five border municipalities with filtered water at cost will be submitted to the ratepayers in January. The project will involve $2,000,000.

WENT OUT ON STRIKE

Moncton, N.B.—About fifty pipe fitters and plumbers for the Ballantyne Co., of Montreal, on the T. Eaton building, struck because two non-union men were working. The strikers were supported by the local Building Trades Council. After a mass meeting they decided to remain out.

SEEKING A CHARTER

The steam and sprinkler fitters' helpers of Halifax have made application through C. C. Dane for a charter in the Plumbers' and Steam Fitters' International.

TO HONOR PLUMBER'S MEMORY

In memory of the late W. R. J. Hughes, a master plumber of Montreal, who died suddenly in the club rooms of the Royal Caledonian Curling Club last winter, a cup to be known as the W. R. J. Hughes memorial trophy is to be provided and contested for. This trophy has already been donated as a tribute to the late Mr. Hughes and is a fitting memorial to one whose heart was so much in the Canadian game, played extensively each winter by Montreal enthusiasts. Mr. Hughes had been playing a game with his friends, and upon complaining that he did not feel well, stepped into the clubs rooms and expired in a few minutes.

CITIZENS WANT INSPECTOR

Woodstock, Ont.—The recommendation of E. S. Estlin, Provincial Gas Commissioner, that the city appoint a gas inspector does not meet with the approval of all the members of the council. Some think that if the gas company fulfills its duties it should not be necessary. Ald. Glaves says he thinks an inspector should be appointed. The matter will be dealt with by the council. Many citizens think that the appointment of such an officer would result in the conditions here being improved.

SEWAGE PLANS APPROVED

The city council at Woodstock, Ont., has been informed that the Provincial Board of Health has given its approval to the proposed new intercepting sewer and sewage disposal scheme, and accordingly a by-law regarding it will be submitted to the people at the time of the municipal elections the first of the year. The new plant will cost $100,000, and will overcome the long-standing sewage troubles of the city, and particularly those in the southern portion. The work of construction will be commenced as soon as possible next spring.

WATERWORKS EXTENSIONS

Brantford.—Plans for waterworks extensions now being worked out by the local authorities call for an expenditure of from $500,000 to $600,000. A by-law for this amount will likely be submitted.

CHEAPER GAS AND WATER

Kingston, Ont., is to have gas and water rates reduced at the end of the year. The price of gas, which rose from $1 to $1.50 during the war, is to be dropped to $1.25.

KILLED IN CROSSING FATALITY

Miss Jean Scott, daughter of R. Scott of the plumbing firm of Scott and Bennett, Galt, Ont., was killed at Buffalo when a New York Central passenger train crashed into an auto at the Harlem avenue crossing. Six others who were in the car were killed also. Miss Scott was a nurse at the Homeopathic Hospital, and, with the others, was returning from a party when the accident occurred.

CONTRACTS AWARDED

W. McCaffery, Ste. Anne de Bellevue, Quebec, has contract for plumbing and heating for the new parish hall for St. George's Anglican Church.

Moose Jaw Plumbing and Heating Co., Moose Jaw, Sask., has contract for plumbing and heating for new public comfort station costing $20,000.

Elliott Bros., Kingston, Ont., have plumbing and heating contract for new school costing $125,000 for the Board of Education.

Napoleon Deguire, Joliette, Quebec, has contract for plumbing and heating for new Roman Catholic school costing $90,000.

Haig and Burns, Lansdowne, Ont., have plumbing, heating and roofing contract for new bank costing $16,000 for the Merchants' Bank.

Anguish & Whitfield, Brantford, Ont., have contract for plumbing and heating for new bank at Parkhill, Ont., for Merchants' Bank.

A. E. Hayman, Stellarton, Nova Scotia, has heating and plumbing contract for new bank costing $38,000 for Bank of Nova Scotia.

Anguish and Whitfield, Brantford, Ont., have heating and plumbing contract for new bank to cost $17,000 at Tara, Ont., for Merchants' Bank.

H. Birnon, Three Rivers, Quebec, has plumbing and heating contract for new buildings for E. Deshaies, Cap de Madeleine, Quebec.

Anguish & Whitfield, Brantford, Ont., have contract for plumbing and heating for new residence for Dr. J. W. Robinson.

Ecclestone & Bates, Limited, Bracebridge, Ont., have been awarded a contract for twenty more bathrooms in the Beaumaris hotel annex.

Van Tuyl & Fairbank, Petrolea, Ont., have been awarded the plumbing and heating contract for new nurses' home of the Charlotte Englehart Memorial Hospital.

TENDERS

Plans are to be prepared at once for new court house costing $100,000 at Kerrobert, Sask.

Tenders on heating and plumbing for new Central school at Glace Bay, Nova Scotia, are to be called at once.

W. Fryer, 5 Glen Ave., Ottawa, wants tenders on heating, plumbing and electrical work for new residence costing $5,500.

R. W. Baxter, 142 Harvey St., Chatham, Ont., wants prices on heating and plumbing for new residence costing $6,000.

V. D. St. Louis, 108 Hall Ave., Windsor, Ont., wants prices on heating and plumbing for two new residences costing $5,000.

Suydam Realty Co., 36 Toronto St., Toronto, plan erection of twelve residences to cost $60,000.

Kitchener Housing Commission, Kitchener, Ont., wants tenders on heating and plumbing for eight residences to cost $24,000.

Erection of a new college at London, Ont., for the Ursuline Sisters, Chatham, Ont., to cost $150,000, is planned. Work to start in spring.

D. O. Yeoman, Amherstburg, Ont., wants prices on heating and plumbing for new bungalow to cost $6,000.

The Sanatorium Board at Brantford, Ont., will submit by-law shortly to provide for $20,000 for the erection of a residence for the staff.

R. M. Rive, 230 Highfield St., Moncton, N.B., wants prices on heating and plumbing for ten residences to cost $35,000.

L. C. Tarlton, 393 Wiseman Ave., Outremont, Que., wants prices on heating and plumbing for residence costing $8,000.

N. Hollister, 514 Bay St., Ottawa, Ont, wants prices on heating and plumbing for alterations to apartments costing $6,000.

Restmore Mfg. Co., Vancouver, B.C., wants prices on heating and plumbing work in connection with new boiler house to cost $10,000.

B. H. Prack, 50 Bay St., Toronto, is preparing plans for new factory for the Firestone Tire Co. Hamilton, Ont.

Plans are to be prepared for the erection at London Ont., of a college building to cost $150,000 for the Assomption College, Windsor, Ont.

An addition to the Paterson Hotel, Owen Sound, Ont., to cost $20,000, is planned. C. W. Douglas, manager.

A by-law will be submitted at Brantford, Ont., shortly, to provide $165,000 for extensions to the general hospital, and alterations to nurses' home and isolation hospital.

R. A. Johnston 90 Agricola St., Halifax, N.S., will let plumbing, heating and electrical work in connection with new hall costing $20,000 for the St. Joseph's H. C. T. A. & B. Society.

Plans are being prepared for a $25,000 addition to the plant of Wm. Patterson, Son & Company at Brantford to be used for the manufacture of candy.

Montreal Strike Settled

Speeding Up of Business is Looked for as Result and Trade Outlook Generally is Most Satisfactory

THE strike of the Montreal plumbers, and which has been in progress for the past nine or ten weeks, is practically a thing of the past. The grievances of the journeymen, SANITARY ENGINEER understands, have been those of wages and hours, more money per hour and shorter working hours being desired. It is expected that details of the differences will be amicably settled, and if so, the termination of the strike will be welcomed on all sides.

A great many of the master plumbers have been able to "carry on" in a more or less satisfactory manner. With all, however, it is felt that much work must needs have accumulated. With the difficulties that usually confront the employer or labor under the conditions of to-day, contracts have not been rushed into, nor entertained, with the possibilities confronting one of being up against labor shortages. For this reason, many jobs and contracts have been purposely steered clear of. It has caused no small amount of trouble.

Asked as to the outlook, one of the leading master plumbers said to SANITARY ENGINEER that there would undoubtedly be a considerable amount of bigger work offering almost immediately. While, as before stated, the shops have been handling work, and some of them with a fairly large staff, they will now be in a position to take on new work, and the larger class of which they have purposely evaded. Providing the weather conditions are not too severe, it would seem that the local trade bids fair to speed up, and a considerable volume of business will be overtaken, undoubtedly, before the turn of the year.

Ontario Executive is Planning Visits to Hamilton, Niagara Falls and Peterborough

Important Matters Regarding Organization Work and Co-operation to be Taken Up With the Master Plumbers —Pulling Together Will Bring Results

THE directors of the Ontario Society of Domestic Sanitary and Heating Engineers are busy with plans for a series of meetings to be held with the men in the trade at various points in Ontario. Visits are contemplated in the near future to Hamilton, Niagara Falls and Peterboro. These points are merely under consideration at the present time and no dates have as yet been set for the holding of the meetings.

There are many matters in connection with organization and co-operation which the directors wish to take up with the master plumbers in various districts. Splendid progress is being made in getting the men in the trade working together not only in their own towns or districts but also along the wider lines of provincial and Dominion co-operation.

Good results are bound to follow if all work together and the executive officers are sparing no time or trouble to bring about these results. Much has been accomplished by the meetings already held and they will be continued.

Organization Work Discussed at Oakville Meeting

ON Wednesday evening of last week the directors of the Ontario Society of Domestic Sanitary and Heating Engineers paid a visit to Oakville and discussed at some length with the men in the trade along the Toronto-Hamilton Highway matters regarding the extension of the work and organization.

The master plumbers in this territory are contemplating organizing, and the executive officers went into this question with them. President Thomas J. Minnes, of Brantford, Ont., spoke on the excellent results that have already been accomplished, and also pointed out the work that remains to be done. He emphasized the benefits to be obtained by the whole trade if every member works together, and showed how conditions will not only be improved for each individual but for the sanitary and heating engineers throughout the province and the Dominion.

Two Big Factors

He spoke of the work to be done in educating the men in the trade to a realization of the vital importance of conducting their business in a systematic and business-like manner. He also spoke of the importance of developing the salesmanship side and of the excellent profits to be made therefrom. He was able to give considerable first-hand information as to what is being done by the master plumbers in Brantford and some other Ontario points, and this was listened to with much attention.

Talks on the work of the association

Continued on page 31

Important Ruling Made by Board in Electric Lamp Case

Decision is That Canadian General Electric Co. Made Use of its Rights so as to Restrain Trade in Production of Incandescent Lights

A JUDGMENT that may have far-reaching effects was handed down at Ottawa by the Board of Commerce when it found that the Canadian General Electric Company of Toronto, as the holder of certain patents in respect of tungsten filaments, has made use of its rights, so as to restrain trade and commerce in relation to the manufacture and production of incandescent electric lamps. The judgment points out that while the Board has jurisdiction over monopolies, even when possessed or controlled by a single individual or company, and might, therefore, make a specific order, the Exchequer Court has special jurisdiction over the matter of patents.

Board Has Power

Under Section 13 of the act, it is within the power of the Board to make a report to the Minister of Justice when patents have been used in restraint of trade and the Minister may exhibit an information in the Exchequer Court praying for a judgment revoking such patent. This course has been adopted by the Board, the judgment stating that this course will permit of the matter being further investigated by a tribunal technically equipped for that purpose.

This case arose out of the complaint of the Canadian Laco-Phillips Company, Limited, Toronto, that the Canadian General Electric Company, also of Toronto, who control the manufacture of drawn tungsten wire in Canada by virtue of several patents, have refused to sell such wire to the applicants for use in the manufacture of lamps.

Ask For Relief

The respondents are themselves manufacturers of lamps, and it was alleged that they were seeking to have a monopoly of lamp manufacture in Canada. Applicants declared that the respondents have brought themselves within a definition of a combine, in the act, and ask for appropriate relief.

The question of whether the patents in question covered the manufacture of wire or the manufacture of lamps was argued before the Board, which held that it was the tungsten process and not the lamps, which was protected.

Monopoly, Says Board

It is the view of the Board that the respondents have acquired a monopoly with relation to the article in question, and such monopoly is operative and likely to operate against the interests of producers of incandescent electric lamps, and very probably also against the interests of the public in that the manufacture and the supply of electric lamps is restricted by the use of respondents are making of their monopoly of the production of tungsten wire filaments. Vacuum lamp-making is not protected by the patents, the Board rules, but merely the manufacture of the wire filament.

Minister of Health Takes Steps to Enforce Better Sanitation

EDMONTON.—The Provincial Board of Health, composed of two medical men and a sanitary engineer, all acting under the direction of the Minister of Health, have been steadily tightening the lines all over the province on the question of sanitation. The minister explains that it is not the intention of the department to put municipalities to any expense by way of costly schemes, but that it has been made plain by circulars and otherwise to the proper authorities, that public places, such as public houses, restaurants, slaughter houses, etc., must be kept in good sanitary condition.

While the great majority of public places in the province are well conducted, complaints come from travelling men as to one here and there, that is in an absolutely filthy condition of uncleanliness, as to certain restaurants and numbers of out premises generally. After repeated warnings to the proper municipal authorities and occupants, the five sanitary inspectors were instructed to commence prosecutions. Recently prosecutions were laid and convictions obtained as follows:

Town of Ryley: Mah Hing, proprietor of the Ryley restaurant; J. H. Ying, proprietor of the Ryley Hotel.

Youngstown.—James Howell, hotel keeper.

Delia: A. Nichol, proprietor of the Queen's Hotel.

Wetaskiwin: Dong Wing, proprietor of the Club Cafe; Wong King, proprietor of the B. C. Cafe; Wong Hing, proprietor of the Union Cafe; Ching Chong, proprietor of the Palace Cafe; Je Key, proprietor of the Royal Cafe.

Sibbald: Won Hing, proprietor of the restaurant.

Ponoka: Sing Key, proprietor of the Rex Cafe; Mah Poy, proprietor of the Mah Poy Cafe; Mah Yuen, proprietor of the Leland Hotel; Mah Fong, proprietor of the laundry; J. Duncan, private resident; Ed. Basgom, private resident.

The fines imposed would vary from ten to fifty dollars with costs.

Apparently it is the determination of the department to protect the travelling public from uncleanliness in public places, and communications from travelling men to the Department of Health, who find conditions such as should not exist, if marked confidential, will be treated as such, and an inspector sent forward to look into the situation.

The minister points out that there is a heavy penalty provided for in the statutes against members of local boards of health who take no steps to see that all public places within their jurisdiction are kept in a sanitary condition.

ASKING FOR $75,000 FOR NEW PUMPS

Works Commissioner Harris has reported to the Board of Control of Toronto that one of the four electrically operated boring pumps at the main water works pumping station, all of which were installed in 1911, has been out of commission for some time, while the other three were in such condition that further repairs were practically useless. He recommended that new pumps be ordered as early as possible at an approximate cost of $75,000, which he intended to include in the estimates for 1920.

The Board decided to ask Mr. Harris why the pumps had become useless within so short a time.

PLAN WATER SYSTEM

If the by-law which is to be submitted to the ratepayers of Beaverton, Ont., on January 1 carries, people who spend the summer upon the lake front there will have all the conveniences of running water in their cottages. At a meeting of the Town Council it was decided to submit to the electors a by-law providing for the installation of an $85,000 water system. The by-law provides for a pumping plant, filters, standpipe and five miles of water mains. Cottages for a mile along Lake Simcoe will benefit by the scheme. Engineer E. A. James attended the meeting and explained the plans to the Council.

TO COMPLETE SEWAGE INTERCEPTOR

Tenders were received by the Essex Border Utilities Commission, Windsor, Ont., until November 27, for completing the south sewage interceptor in Sandwich and Ojibway Ont.

The work consists of laying approximately the following lengths of reinforced concrete lock-joint pipe in four-foot lengths, which is now on the work: 16 ft. of pipe, 42 in. diameter; 4 360 ft., 39 in.; 4,320 ft. 27 in. The work also includes the building of 15 concrete and brick manholes and setting cast iron frames and covers; pumping and clearing out 4,000 ft. of existing sewer 42 in. and 27 in. in diameter, and shaping up ditches; replacing 80 sq. yds. of concrete street pavement.

Directors Visit Galt and Kitchener

Co-operation Will Solve Every Individual Difficulty and Every Problem of the Trade Generally, Says Vice-President George E. Grinyer—Secretary Frankland Tells About Importance of Overhead

THE directors of the Ontario Society of Domestic Sanitary and Heating Engineers held their regular monthly executive session for November at Galt on Thursday afternoon last. In the evening the officers went over to Kitchener and at a well-attended meeting of the members of the Twin Cities Club, including men in the trade from both Kitchener, Waterloo and Elmira, addresses were given.

Vice-President George E. Grinyer, of Guelph, presided at the meeting in Galt, and among those in attendance were Messrs. Scott and Bennett, Frank J. Short, H. A. Lyall and W. H. Pinkett, of Galt, and W. A. Spalding and George S. Bowman of Preston. Applications for membership in the Ontario Society were received and accepted from these. It is planned to hold a series of meetings at Galt, Preston and Hespeler.

Urges Co-operation

Vice-President George E. Grinyer, of Guelph, made a strong address, in which he pointed out that if the men in the plumbing and heating business expect to improve conditions in the trade there is only one way to do it, and that is by working together. Co-operation, he said, would not only solve the problems of the master plumbers in each town, but, by working together all over the province and all over the Dominion, results of a larger kind could be secured, which would be of direct benefit to all.

He told of the splendid practical work that is being carried on by the Ontario society in its efforts to give the men in the trade practical knowledge regarding the essentials of business, system and salesmanship.

Get On Broader Basis

K. B. Allison, chairman of the Educational Committee, based his remarks on fellowship and humanity, and urged the men in the trade to get a broader vision than mere local or individual and selfish interests. Improved conditions for one man mean improvement for all, and what hurt one man indirectly injured all. Many people, he stated, did not realize this. He urged every man in the plumbing and heating business to work together for the greatest good for all. This, he said, would put the trade on a broader basis; not a mere basis of dollar and cents, but the greatest benefits for all.

Tells of Overhead

Secretary Garrett Frankland went into the question of "overhead," and explained in detail what a vital factor it is in the successful conduct of business today. Without a thorough knowledge of how to figure, he said, no man could hope to get the results he ought reasonably to expect. There are endless ways of losing money, and the sooner they are stopped, the sooner a business will commence to show profits.

Harvey Hymmen, of P. Hymmen & Co., Kitchener, was chairman at the meeting, and among those present were H. A. Haas, of M. Weichel & Son, of Waterloo; John Hainsworth, Henry Wolfhard, William Knell, Herbert Klem, W. F. Doerfling, John Shiry, of Kitchener, and Fred Rudow, of Elmira.

Applications Accepted

Applications were received and accepted for membership in the Ontario society from P. Hymmen & Co., J. Shiry, H. Klem, and Doerfling and Forler.

NOT VERY SERIOUS

As stated in a recent issue of SANITARY ENGINEER a report on allegations in connection with plumbing work at Peterboro, Ont., was to be made. This has been made, and in submitting to the Property Committee an itemized report of his investigation of the alleged faulty plumbing in nineteen local buildings, W. H.. Meadows, chief of the division of plumbing and drainage of the Toronto Council, advised that Peterboro's by-law be revised. In this connection he stated that the present by-law does not permit the use of brass waste and vent piping. Mr. Meadows considered this material satisfactory and said that it was generally accepted, otherwise he would have had to condemn work he considered satisfactory.

Not Being Published

The committee deemed it inadvisable to publish the report because of a possible liability for damage claims from citizens whose plumbing had been approved by the city's plumbing inspector. The chairman, Ald. Hamilton, suggested that City Solicitor Widdifield be asked for his opinion as to whether the municipality in view of its responsibility for the local inspector could be compelled to make or pay for the alterations to certain plumbing which Mr. Meadows reported as not fulfilling the specifications of the city's plumbing by-law.

Ald. Edgar proposed that Mr. Peter Thompson, the inspector, be asked to explain the faulty work underlined in Mr. Meadows' summary of his inspection.

Matter Laid Over

The committee declined to delve into the question because of the lateness in the year, and Ald. Edgar moved, seconded by Ald. Hamilton, that the report be referred to next year's council with a recommendation that the administration of the plumbing by-law be placed under the control of the Board of Health instead of under the property committee.

Ald. Hamilton remarked that there was nothing very serious in Mr. Meadows' report. Lack of vents and the provision of only one trap for three and more basins were the faults that recurred rather frequently in Mr. Meadows' enumeration.

APPROPRIATION EXCEEDED

At the present time the Ontario municipal housing schemes approved call for an expenditure of more than $10,000,000 or $2,000,000 over and above the Federal grant and of this perhaps half is already committed by buildings under way.

The town of Oshawa on Friday last sent a deputation to Hon. C. H. Nixon, Provincial Secretary, and asked for endorsation of a housing scheme extension involving an expenditure of $400,000 in addition to the $500,000 already allotted it. Up to the present Oshawa's housing operations represent an expenditure of $300,000. The Minister promised consideration.

ORGANIZATION WORK DISCUSSED

Continued from page 29

were also given by Treasurer Thomas R. Maxwell, Secretary Garrett Frankland and K. B. Allison, chairman of the Educational committee.

Among those who attended the meeting were J. H. Doughty of Mimico, A. J. Ingram of New Toronto, T. W. Slean and W. Barrett of Oakville.

It is planned when organization is effected, to hold a series of meetings to include Burlington, Oakville and Mimico.

Wm. Skelly, London, Ont., has the contract for the plumbing work in connection with addition that is being erected to the dry goods store of T. F. Kingsmill.

The Canadian John Wood Manufacturing Company, Limited, head office Toronto, capital $200,000, plans to manufacture and deal in range boilers, galvanized goods, barrels, containers, etc.

Thermos Heating Systems, Limited, capital $600,000, head office Montreal, plans to manufacture and deal in hot water systems, steam boilers and heating equipment.

R. Watt, Ridgetown, Ont., wants prices on heating and plumbing for two residences he plans to erect.

The Cluett Peabody Co., Walkerville, Ont., plans the erection of a new plant at Montreal to cost $100,000.

Heating and Ventilating

Ventilating the Modern School

Sixteenth Article of Series Written Especially for "Sanitary Engineer" by N. A. Kearns—First Article of Series Appeared in April 1 Issue

AMONG the simple types of heating and ventilating apparatus that have come to us from practices of the past, that one where the direct radiators are also used to heat the air for ventilation is perhaps the best known to the general public.

In the very outset of this article it must be admitted that, in some cases, plants of this nature have been more or less of a failure, both with regard to heating and ventilating efficiency. The reasons for the failures should be obvious: too much hit or miss method in the making of designs for systems that would, under proper conditions, provide a degree of excellence often sadly wanting in our more modern system.

Has Vital Quality

Even the most rabid critics of the system cannot truthfully deny that air passing into a room by way of direct-indirect heating surfaces seems to carry in from the out of doors some vital quality, that is not always present in fresh air when it is warmed by other means.

We believe that the majority of men in the heating and ventilating trade are broad enough in their views to appreciate the merits of any system, even though such merits may be buried under a multitude of faults. The man who is really progressive knows how much of modern science is carried on the wheels of old principles, and therefore he never vigorously condemns a thing because it is a child of, what other men may term, antiquated ideas.

The principle of this system, in itself, requires no less nor more of apology than does the principle of any other system of heating and ventilating. The annoying faults of ventilating systems are more frequently due to wrong application of principles than they are to the principles themselves. And there is little doubt in our mind that when direct-indirect radiators are installed, with proper arrangements for foul air exhausts, they will perform their function in a way to convert their most fiery critics to staunchest advocates.

Unequal Distribution

The principal defect in most of the systems where direct-indirect radiators are used is found in the unequal distribution of the fresh air. In some of the previous articles of this series, consideration has been given to the natural paths taken by currents of heated and of cold air. That consideration, if taken here, should be the means of disclosing the capital reason for the defect that hitherto has seemed to be an inherent part of ventilating plants of this character. We do not believe that it is necessary to repeat here the recommendations made in former articles with regard to the necessity of having more than one foul air exhaust in a large room when direct air flushing is the principle used in maintaining a standard of air purity. Reference to former articles will give the reader all of the data he may require when designing the foul air exhausts for a system like that herein described.

On Special Bases

Direct-indirect radiators are simply direct radiators set on special bases. These special bases are the "cold air chambers" of this system, and are connected to outer-air openings by the means of wall boxes. The outer-air opening may be set below the floor on which its connecting radiator is set, or it may be set on the same level as the base of the radiator. In any case, the outer-air opening must be proportioned to the heating surfaces above the base, and relative to the quantity of air that is to be admitted. This is one detail that has often been left to a hit or miss method for the setting of ratios.

The wall box, in other words the fresh air intake, should be fitted with louvers so that the snow and the rain may be kept out. It should also have a 14-inch galvanized iron screen, to keep out insects and birds. The box should be of cast iron; sheet metal is too light for such a purpose; and as every precaution must be taken in providing durable fixtures where repairs are frequently difficult to make, it is well that these boxes be made of the heaviest material available, viz: cast iron.

The bases under the radiators should have double-acting dampers, set so that when the outer-air pasages are closed corresponding inner-air passages may be opened. Thus, when the air from out of doors is not passing over the heating surfaces, air taken from the room may move in that direction.

There is no use of providing ventilating radiators if no measures are taken to remove the vitiated air from the rooms containing these heaters. The location and size of vent flues require a good deal of careful thought when used in a plant of this description.

Equalizing Valves

Gravity exhaust flues should be equipped with automatic draft equalizing valves; also blow-down check dampers. If vent flues are not so equipped the flues will often carry more air from the rooms than can be properly heated by the radiators; and then on the other hand, if no blow-down checks are installed, the wind coming from an unfavorable quarter may rush down the vent flues and out of the rooms, by way of the fresh air openings set at the bases of the radiators. Where exhaust fans are used there is no need of installing blow-down checks; but there certainly is of the velocity-equalizing valves.

In any system of gravity exhaust of foul air, the vent flues should have sufficient radiation installed therein to effect an upward flow of air. These "draft-accelerating" radiators should be placed just above where the foul air escapes from the room, as they are not of much value when placed high up in the flues. The reason for this was given in former articles. Care must be taken to see that the free areas of the flues are not reduced too much by the presence of the accelerating radiators.

Area of Heating Surface

The area of heating surface required for heating the air for ventilation may be readily estimated by basing the figures on an average condensation of .4 of a pound of steam per hr. or 386 B.t.u.

If we have a class-room containing 40 pupils and one teacher we could proportion the direct-indirect radiation so that each occupant would receive 20 cubic feet of air per minute, thus:

41×20 cubic ft. per minute $= 861$ cu. ft. per min. 861 cu. ft. $\times$ $60 = 51660$ cu. ft. per hr. Specific heat of air 55. $51660 \div 55 = 939$ E.G.S. Temperature range, 89°. Heat loss $939 \times 80 = 75120$ B.t.u. Radiation required for ventilation only: $75120 \div 386 = 194.6$ sq. ft. To this must be added the areas required for heating the room; usually about 200 sq. ft.

Varying Standards

Now it will be noted that the example gives a standard of 20 cubic ft. of air per room occupant; whereas in describing other systems of ventilation we set

a standard of 30 cubic ft. of air per occupant. We have set the lower standard in this example because it is an example of the direct displacement system of ventilation. Twenty cubic feet of air is a standard quite high enough for such a system, and is, in fact, a much higher standard than that on which many systems of this kind are based. Very often the requirement is that the air be changed 4 times in an hour, and as in ordinary heating systems a natural ventilation effect of one change of air per hour is obtained, and as the cube of the standard class-room is 10,000 ft., the heating surfaces for ventilating service would be, in such a case about 115 sq. ft.

Foul Air Displacement

In basing the foul air displacement at 30,000 cubic ft. instead of at 51,660 cubic feet of air, as first estimated, it will be necessary to proportion the foul air exhaust to correspond to the smaller air discharge.

The cold air openings should be proportioned for an intake of air at a velocity not exceeding 300 ft. a minute.

From the data given, we can estimate that 30 sq. ft. of the indirect part of the radiator will heat about 7,800 cubic ft. of air 80 degrees per hour; also that the area of the cold air opening for this amount of radiation should be 62 sq. inches.

Many handbooks give a rule for estimating direct-indirect radiation by a system of figuring the direct surface necessary to warm the room and then adding from 27 to 37 per cent. to provide heating surface for ventilating purposes. That rule is one of the hit or miss methods, and will not set figures high enough to provide the radiation really required.

Steam Systems Only

Now remember that the figures so far given in this article apply to steam systems only. Hot water systems require more heating surface in proportion to the air heated than do steam systems. For direct-indirect radiation it is safe to allow about 55 per cent. more surface for hot water than for steam. Thus if we decided to use hot water instead of steam we should have to consider the radiation in our example as 46 sq. ft. instead of 30 sq. ft.. as specified in the steam system.

There is one other thing that we did not touch upon when writing of the cold air inlets: the cold air check dampers. All cold air openings should have dampers independent of the double-acting dampers, so that the areas of the cold air openings may be varied to meet different conditions of weather. The omission of this necessary checking damper is very often the cause for failure in many otherwise excellent systems of ventilation.

We must not close our eyes to the defects of any system of ventilation, but rather in admitting the existence of such defects, strive to find some way of overcoming them. We have already written of the fault of unequal air distribution; also of the methods of counteracting that fault. So we may now turn to the danger of the freezing and bursting of direct-indirect radiators; a danger that these radiators are subjected to through faulty manipulation of valves. A room may become too warm, and then the radiator valves are closed. The person who closed the valve may leave the room, forgetting to open the valve. The room becomes cold and the condensation remaining in the radiator becomes frozen. Worse still, the feed valve, if a one-pipe system is used, may be partly opened, then a great deal of water accumulates, all ready to be frozen, when "zipp! there goes another rad."

Danger Is Greater

The danger of having frozen radiators is greater when hot water systems are used than when steam is the heating agent.

As the danger from frozen radiators is increased because of human fallibility it would seem that a measure of the danger might be avoided where automatic temperature control is installed. Then the radiator valves will be always open at the times when heat is most required.

Although it is quite possible to install direct-indirect radiators in connection with a one-pipe distribution system, it is far better to couple this type of radiator to a two-pipe arrangement of supply and feed. The size of the mains and returns can be proportioned the same as for an ordinary two-pipe system for direct radiators; but we must then consider indirect radiating surface as being, at least, equivalent to slightly more than 50 per cent. increase over its area when assuming it to be direct radiation. Thus: 100 sq. ft. of direct-indirect radiator surface is equivalent to 150 sq. ft. of direct radiation when figuring pipe sizes.

The next article of this series will be descriptive of the details of various systems. It will be illustrated with working drawing showing the methods used in applying the principles of different systems in actual work.

Town Planners Want Present Act Amended

More than 150 delegates from all parts of South-western Ontario are attending the 3rd annual South-western Ontario Town Planning Conference, which is being held at Hamilton. Among the proposed amendments to the Town Planning Act which will be submitted to the Ontario Legislature are the following:

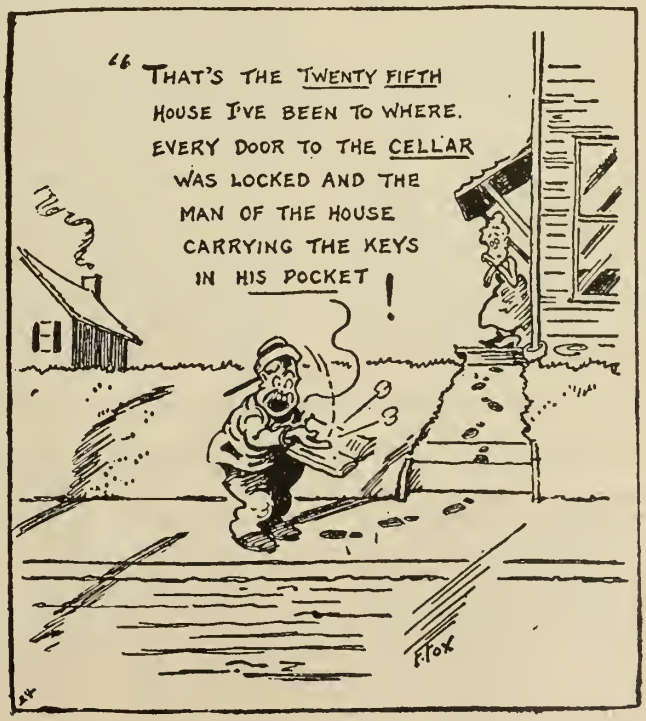
The following powers should be granted under the act to municipalities:

Power to remove or demolish buildings which may be erected in contravention of the provisions of a scheme, after the scheme has been approved, as well as after proper notice is given and while the scheme is being prepared.

Power to prescribe certain areas to be used for dwelling houses, apartment houses, factories, warehouses, shops or stores, etc., and to fix the height and character of the building in these areas.

Power to rectify or alter any existing sub-divisions, including the pooling of lands of several owners, and the roads and streets abutting or adjacent thereto; and to initiate the planning of the sub-division of land in advance of its being placed on sale for building purposes, for the purpose of bringing owners of adjacent lands into line with any comprehensive scheme.

Power to prevent building on low-lying and unsanitary land pending reclamation and until provided with sanitary arrangements at the expense of the owners.


"THAT'S THE TWENTY FIFTH HOUSE I'VE BEEN TO WHERE. EVERY DOOR TO THE CELLAR WAS LOCKED AND THE MAN OF THE HOUSE CARRYING THE KEYS IN HIS POCKET!
F. FOX

BASIS FOR DETERMINING PROFITS

(Continued from page 23)

twine, stationery, etc., book-keeping and accounting, collection of debts, bad debts, delivery, advertising, as well as a proportion of the loss which would come through the fact that he will almost certainly have to sell some of the boots at a lower price than the marked price. It is only when a retail merchant has taken these into consideration, basing the amount on his experience of previous years, or on the experience of others, that he is in a position to fix what is a reasonable marked price.

Must Be Considered

Similarly take the case of bacon. In addition to the other items which have been mentioned as having to be considered by the merchant in fixing the retail price, he must take into consideration the following:

Diminution in weight resulting from evaporation.

Loss in the process of slicing, because certain parts are less saleable or unsaleable.

Loss from the fact he buys bacon wrapped in heavy papers, pays the same price for the paper as for the bacon, and loses whatever has been paid for the paper. The weight of the paper so bought, and which the merchant loses, may amount to many hundreds of dollars in a year.

Cost of High Living

It is the opinion of merchants who have given deep thought to the question that the prices the consumers are paying to-day are due to the cost of high living, rather than to the high cost of living. This condition is reflected in some of the items that are included in the analysis of the cost of doing business. For instance, one of the details of expense that shames the merchant is the cost of delivering goods to his customers.

During the past four years, owing to the higher prices of labor, of equipment and of feed, that cost has grown enormously. The expense of keeping a horse has actually doubled during the past two years. When in the evolution of retail trading the merchant undertook the work of delivering, he entered the field of transportation. Instead of charging for the service rendered by him in that field, as ordinary transportation companies do, he was unwise enough to carry it on gratuitously. He was obliged to include the expense among the items that made up the cost of doing business, which meant that it was reflected in the price of the goods.

Has Included the Cost

The result has been that ever since he began to deliver he has included the cost of service in his retail selling price. It may be added here that retail trade delivery is the most expensive kind of transportation known; it is also worth while to mention that the public has unfortunately been taught to expect a maximum service in this particular. It is the function of the retail merchant to serve the public, and he has now little or no option. If he wants the business he must furnish the delivery. The custom has extended itself so that he cannot control it. It may be that sentiment among retail dealers is favorable to a restriction in delivery service, as recent efforts at reform would indicate. But the general principle of full deliveries cannot be changed. Therefore, the customers who live near a store and carry home their purchases usually pay the same prices as the ones who demand that the articles be delivered in some distant and widely-separated parts of the city. There are frequent occasions, indeed, when the cost of delivery exceeds the selling price of the goods delivered.

Important Factor

We are discussing the subject of delivery at some length because we believe your board is interested in learning about its important bearing on the distribution of merchandise at retail. We would go so far as to suggest that your board consider the advisability of securing to the customer who performs delivery service for himself the benefits of that service. An innovation of this kind would exert a very beneficial influence economically, because it would lead directly to reductions in the retail prices for many lines of goods. We believe that any customer who desires to save the cost of delivery on his purchases by taking the goods with him should have the opportunity of making that saving. The only way in which that saving can be assured to him is by a policy of charges for deliveries.

Dictate Methods

We have already referred to the growing tendencies of outside organizations to dictate methods and terms to merchants as employers. The principal manifestation of this development is to be found, of course, in the case of wages. The increases in wages paid to employees of retail stores during the past two or three years are unprecedented in the history of business. The situation gains seriousness chiefly through the fact that a considerable part of the service purchased by the merchants is inefficient and indifferent at the beginning. The increasing scale of salaries is being paid to employees who come to the place of business uneducated for their work. This fault is largely due to the Government's failure to furnish institutions of education in which employees may be prepared for business careers. Under present circumstances it is essential that the staff be trained by the merchant. Even during the period of education or training, however, they are receiving large salaries based on the current cost of living. As salaries are by far the most important item in the expense of retail business, this state of affairs naturally increases the retail prices. It would seem to us that reforms by the Federal or Provincial Government would terminate the unfavorable features we have just mentioned, and that your board might make effective recommendations along that line.

Requires Consideration

We have deliberately refrained from showing resentment at the interpretations placed by newspaper writers on material submitted to your board. But we feel that an item in one of these papers proclaiming that retail merchants were making a yearly gain of 7,000 per cent. on bacon requires some consideration. Your board may remember that this item purported to give an account of the proceedings here at which retail merchants were being called to testify. While we clearly understand that your board has not exercised jurisdiction over newspaper reports, we beg to submit that these reports mislead the public and do a serious injustice to the retail merchant. Our object in drawing this phase of the subject to your attention is to point out that the principle of basis employed by your board in arriving at the so-called gross profit on various articles is followed by the daily press. It appears to us that there should be attached to your board, as a part of its organization, a recognized expert in the principles of merchandising, who could assist you in determining such matters as profits fairly and accurately.

The Retail Trade Bureau and the Retail Merchants' Association realize that there are problems and weaknesses in the system of distributing merchandise. We desire to make clear to your Board and to the public our belief that some of these may be remedied only through legislation. We know that the retail merchants will gladly co-operate with your board in its efforts to reduce the cost of merchandise. We take the liberty of requesting, on behalf of the Retail Trade Bureau and the Retail Merchants' Association, a similar measure of co-operation.

Percentage of Expense to Selling Price for Year 1918

Submitted by a Winnipeg merchant.

Item.	Per Cent.
Advertising	2.92
Bonuses	1.75
Delivery	.47
Depreciation	.72
Donations	.44
Express and freight	.54
Insurance	1.17
Interest	.33
Light	.47
Postage	.08
Rent	4.56
Repairs	.05
Salaries	14.53
Stationery and office	.08
Sundries	.76
Taxes	.62
Telephones and telegrams	.10
Travelling	.44
Wrapping supplies	.51
Total	30.54

TO PROVIDE WATER SUPPLY

Regina.—Dr. W. D. Cowan, M.P., states that after several sessions with the Minister of Public Works with regard to the situation at the foot of Last Mountain Lake he has secured a promise from the head of the engineering branch that an amount would be placed in the estimates for the next session for the work necessary to retain the water in the lake at its present level, and, at the same time, give an adequate water supply to all farmers in the Qu'Appelle Valley east of the present dam.

Table Showing Price at Which an Article with an Invoice of $1 Must be Sold in Order to Make Any Desired Profit.

Net profit	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
15% Cost of doing business—Sell for.....	1.19	1.21	1.22	1.24	1.25	1.27	1.28	1.30	1.32	1.33
16% Cost of doing business—Sell for.....	1.21	1.22	1.24	1.25	1.27	1.28	1.30	1.32	1.33	1.35
17% Cost of doing business—Sell for.....	1.22	1.24	1.25	1.27	1.28	1.30	1.32	1.33	1.35	1.37
18% Cost of doing business—Sell for.....	1.24	1.25	1.27	1.28	1.30	1.32	1.33	1.35	1.37	1.39
19% Cost of doing business—Sell for.....	1.25	1.27	1.28	1.30	1.32	1.33	1.35	1.37	1.39	1.41
20% Cost of doing business—Sell for.....	1.27	1.28	1.30	1.32	1.33	1.35	1.37	1.39	1.41	1.43
21% Cost of doing business—Sell for.....	1.28	1.30	1.32	1.33	1.35	1.37	1.39	1.41	1.43	1.45
22% Cost of doing business—Sell for.....	1.30	1.32	1.33	1.35	1.37	1.39	1.41	1.43	1.45	1.47
23% Cost of doing business—Sell for.....	1.32	1.33	1.35	1.37	1.39	1.41	1.43	1.45	1.47	1.49
24% Cost of doing business—Sell for.....	1.33	1.35	1.37	1.39	1.41	1.43	1.45	1.47	1.49	1.52
25% Cost of doing business—Sell for.....	1.35	1.37	1.39	1.41	1.43	1.45	1.47	1.49	1.52	1.54
30% Cost of doing business—Sell for.....	1.45	1.47	1.49	1.52	1.54	1.56	1.59	1.61	1.64	1.67

Electric Wiring Contractors Must Obtain Permits From Inspector

OTTAWA. — Electrical contractors who violate the law by installing wiring in any building without first notifying the district electrical inspector and obtaining from him a proper permit for such work, are likely to find themselves in serious trouble.

A Toronto contractor was heavily fined in one of the North Ontario towns recently for failure to observe this regulation, and his case is cited by the local inspector of the Hydro Electric Commission as a warning to be observed by local men who might be tempted to follow his example.

This contractor installed work in a town in the County of Simcoe, and failed to notify the district electrical inspector and obtain a proper permit for such work, which, it is alleged, was found to be defective. This violation was quickly discovered by the Inspection Department, and although they gave him every warning and plenty of time to attend to it, such warnings were ignored, with the result that the contractor was summoned to Police Court, and the magistrate handed out the fine of $450 and costs for first having failed to take out a permit and, secondly, for having failed to remedy the defects when notified.

The Electrical Inspection Department of Ottawa was recently visited by the chief inspector from Toronto, and it is anticipated that a crusade will be made against violators of the commission's regulations, and the local inspectors are on a still hunt for wiring contractors who instal work without proper notice to the Inspection Department before such work is commenced.

Delegates of Labor Urge More Building

The Montreal Civic Commission was waited on this week by a deputation representing organized labor in Montreal. The purpose of this delegation was to seek interests of the Commission in hastening building activity in Montreal. Heading the delegation was Gustave Francq and R. Lynch, who represented the Trades and Labor Council. They asked the Commission to proceed without delay in completing personnel of the Housing Commission, so that they might report back to the city in the immediate future.

It was pointed out by the above committee that the workingmen of Montreal anticipated an increase in residential rents in the spring, and that because of this they were anxious that the housing scheme might be proceeded with. It will be recalled that Montreal had four million dollars allotted to it under the Government Housing Plan, and it is that this amount may be made use of at an early date that the labor interests have interested themselves.

In leaving the commission, which promised a definite reply within a few days, the speakers are reported to have said: "If we cannot make it go here, we will approach Quebec, and then Ottawa."

WESTERN MAN URGES CLOSER TRADE CO-OPERATION

L. A. Guertin, of Vancouver, B.C., was the speaker at a meeting last week of the Montreal Chambre de Commerce. As a former French-Canadian, who had made good in the Western Provinces, he was given a hearty reception by the Montreal body of Canadian business men and spoke regarding the development of closer trade relations between the East and the West.

Mr. Guertin pleaded for the development of closer trade relations between the province of his birth and the one with which he has chosen to associate himself in his business life. He particularly pointed to the fact that United States firms control nearly all the Western trade, the possibilities of which, he said, apparently have been overlooked by the eastern part of Canada. He deplored the fact that capitalization of various promising industries of his adopted province, Eastern Canada, and particularly Quebec, holding a metropolis, has not taken the initiative, but has left it to the interests of the United States. As a means of opening the eyes of the Eastern manufacturers to the possibilities in the West, the speaker suggested that an excursion to that city be taken.

In expressing his appreciation for the address of Mr. Guertin, Jos. Quintal, president of the Chambre de Commerce, voiced his hope that trade development between the two provinces would improve and hoped that this matter would be studied.

GENERAL MARKETS

Continued from page 38

Plumbers' Compression and Brass Work Firm

COMPRESSION AND PLUMBERS' BRASS work shows no change over the new price quoted in last issue of SANITARY ENGINEER. The market for the raw materials used in the production of these goods has been unsettled and it depends on conditions whether their prices will be affected or not. However, the markets for these are easily affected, and a change in price of the manufactured product is not looked for at present. Quotations for some of the better known lines are as follows:

Compression work, standard	28%
Fuller work, standard	34%
Bath cocks, compression	30%
Bath cocks, Fuller	34%
Flatway stop and waste cocks, standard	32%
Roundway stop and waste cocks, standard	32%
Brass steam cocks, standard	Net List
Globe, angle and check vales, standard	5-9%
Do., removable disc	7-10%
Radiator valves, standard	15%-23%
Do., removable disc	40-46%
[illegible] Cocks	
No. 0 and 1, Fuller pattern	34%
Compression	23%
Quick opening	34%

Firmer Tendencies on Ingots; Demand Quiet

INGOT METALS show little change, the tone of the market being somewhat firmer, with a tendency to advance. Copper is inclined to be a little unsettled, showing a slightly stronger tendency. The local market, however, shows little change in price, and quotations are as follows:

TIN is somewhat firmer and shows a slight advance, with a firmer tendency. The present quotations are 60 cents per pound.

SPELTER shows a good demand, the present market being a firm one. The quotation going at present is 10½ cents per pound.

COPPER is slightly unsettled and practically depends on condition as to what the future prices will be. The present quotation of 24 cents per pound is not considered high.

ALUMINUM shows no change and continues to be quiet. The quotation going is 34 cents per pound.

LEAD is showing stronger tendencies. The present quotation of 8½ cents per pound is holding.

ANTIMONY is quiet, little movement being noted, the demand having temporarily eased off. The price going at present is 11½ cents per pound.

DO YOU KEEP ACCOUNTS CLEANED UP ?

Continued from page 18

are honest and will pay a little at a time, he will give them every consideration.

The final letter to be sent out before taking legal action may be worded as follows:

Dear Mr. ———

This makes the fourth letter we have written you, asking that you make some kind of settlement of your long past due account.

So far you have not paid any attention whatever. Do you think this course on your part is right? Place yourself in our shoes and see how you would like it.

Unless some arrangement is made to pay this account by the 10th of this month, we shall consider it our duty to hand same to the attorneys.

We have enjoyed doing business with you, and believe you have found us fair and square. But ignoring us as you have does not help one bit.

So please step in and pay up the account, or part of it, before the 10th. Save us and yourself expense, and we shall be glad to continue with you as formerly. There is no personal feeling in this letter at all; we simply need the money due us.

Thanking you in advance for the courtesy of a settlement by the date mentioned, we are,

Yours very truly,

Market Conditions and Tendencies

STATEMENTS REGARDING SUPPLIES AND TREND OF PRICES

THE MARKETS AT A GLANCE

THE tendency of prices is still in an upward direction and a number of new and higher prices have gone into effect. An advance of approximately 5 per cent. has gone into effect on wrought iron pipe and new net prices are shown below. There is a continued shortage of iron and steel products, particularly sheets and plates.

There is a continued heavy demand for enamelware and prices continue unchanged. The coal strike is having an adverse effect on all classes of business and if continued will seriously affect output.

TORONTO, ONT., December 1.—Higher tendencies are still being noted throughout the trade, and if present indications are any guide, higher prices may be expected. Nipples and wrought pipe show higher prices, and a brisk demand is being looked for throughout the year of 1920. The present coal crisis has as yet not affected to any extent the local markets generally; it is, however, hard to state what will happen if present conditions continue.

The enamelware situation is on the mend and it is believed that the situation will automatically relieve itself. Manufacturers state that their factories are gradually getting back to a larger production basis, which has been badly disturbed and that by spring will be able to satisfactorily handle all business offering, they state.

Wrought Nipples Advance; New Price Firm

NIPPLES.—An advance in nipples has gone into effect and the new prices that are now being quoted are: Nipples up to 4 inch, less 75 per cent.; 4½ and larger, less 65 per cent.; running thread, 4 inch and under, less 45 per cent.

Wrought Iron Pipe; Some Sizes Up 5%

WROUGHT IRON PIPE.—Standard lapweld wrought iron pipe shows an advance of approximately 5 per cent. for sizes 4½ inch and over. Prices are holding firm on the new list, and the demand is a stiff one. One reason given for the brisk demand is that people have more money to spend for improvements and building purposes. and are pressing merchants and plumbers for immediate deliveries These dealers, to a large extent, have orders already placed to take care of their requirements, but in order not to lose any business they reorder, perhaps from some other house, thus making two requisitions for practically the same demand.

The steel strike, however, remains the main factor, and if the coal crisis is not soon remedied and the train curtailment takes effect, the situation will undoubtedly become more serious. The following is the new list:

WROUGHT PIPE

Price List No. 41, Nov. 14, 1919

Standard Buttweld

		Steel		Gen. Wrot. Iron	
		Blk.	Gal.	Blk.	Gal.
		Per 100 feet			
⅛	in.	$ 6 00	$ 8 00	$.....	$.....
¼	in.	4 53	6 66	5 13	7 26
⅜	in.	4 53	6 66	5 13	7 26
½	in.	5 99	7 57	6 84	8 42
¾	in.	7 53	9 66	8 68	10 81
1	in.	11 14	14 28	12 84	15 98
1¼	in.	15 07	19 32	17 37	21 62
1½	in.	18 01	23 10	20 76	25 85
2	in.	24 24	31 08	27 94	34 78
2½	in.	38 90	49 73	.....	.....
3	in.	50 87	65 03	.....	.....
4	in.	76 85	97 01	.....	.....

Standard Lapweld

		Steel		Gen. Wrot. Iron	
		Blk.	Gal.	Blk.	Gal.
		Per 100 feet			
2	in.	$ 27 94	$ 34 78	$ 31 64	$ 38 11
2½	in.	40 66	51 48	46 51	57 33
3	in.	53 17	67 32	60 82	74 97
3½	in.	66 70	83 72	75 90	92 92
4	in.	79 03	99 19	89 93	110 00
4½	in	88 00	107 00	114 00	138 00
5	in.	103 00	132 00	132 00	161 00
6	in.	133 00	171 00	172 00	209 00
7	in.	175 00	224 00	223 00	271 00
8L	in	184 00	235 00	234 00	285 00
8	in.	212 00	271 00	269 00	328 00
9	in.	254 00	324 00	323 00	393 00
10L	in.	235 00	301 00	299 00	365 00
10	in.	303 00	387 00	385 00	470 00

Terms, 2% 30 days, approved credit.

Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Waste and Oakum Firm; Prices Remain Steady

WASTE AND OAKUM.—Business handled in these commodities this year has been very satisfactory, it is stated, and some claim the largest turnover in the history of their business. Owing to the lateness of the season the demand is beginning to slacken off and jobbers are preparing now for a large volume of trade in the new year which they are expecting. The present quotations remain unchanged and are as follows:

	Per 100 lbs.	
Best American	$21 00	$22 00
Clipper, spun	.....	21 00
Do., unspun	....	19 50
Plumbers' spun	10 00	10 75
WASTE		
Cream, Polishing	....	0 21
White—		
XXX	....	0 18
XX	....	0 16¾
X	....	0 15¾
XC	....	0 13½
Japanese	....	0 13
XXX Extra	....	0 19
XX, grand	....	0 17¾
XLCR	....	0 16½
X Empire	....	0 15¼
X Press	....	0 14
Colored—		
No. 5	....	0 13¾
No. 1	....	0 12¾
No. 7	....	0 11¾
No. 1A	....	0 10¾
No. 1B	....	0 09¾
Fancy	....	0 15
Lion	....	0 13½
Standard	....	0 12
Popular	....	0 10½
Keen	....	0 09

Above lines subject to trade discount for quantity.

Firm and Steady Are Lead and Zinc Products

LEAD AND ZINC PRODUCTS are showing no change, and prices are firm and holding very steady. No immediate change is looked for at present, although it is hard to predict future market tendencies, owing to so many unsettled conditions. Quotations are as follows:

Lead pipe, list, per lb.	....	$0 12½
Lead waste pipe, list, per lb.	....	0 13½
Do., over 8 inches, list, per lb.	....	0 14½
Above subject to discount of 10%.		
Lead traps and bends	....	15%
Lead wool, lb.	0 11	0 12½
Lead sheets, 4 to 6 lbs., sq. ft., in rolls, lb.	0 12	0 18
Cut sheets ½ to ¾c lb. extra and cut sheets to size, 1c lb. extra.		
Solder, guaranteed, lb.	0 35½	0 38
Solder, strictly, lb.	0 34½	0 37
Solder, commercial, lb.	0 32½	0 35
Solder, wiping, lb.	0 31½	0 34
Solder, wire, lb.	0 35½	0 41
Zinc sheets, per lb.	....	0 17

Serious Shortage in Sheets and Plates

SHEETS AND PLATES.—The sheet situation is not at all encouraging and some of the remarks on the situation by large jobbers are: "Serious," "Mighty tight," "Expect no relief for six months," etc. This expresses the general situation, although some have been more fortunate than others, and owing

MADE IN CANADA

MUELLER
Self-Closing Basin Cocks

EXTRA PATTERN

The closing is actuated by a phosphor-bronze spring, which has permanent elasticity. Tension of this spring will close against 175-pound pressure.

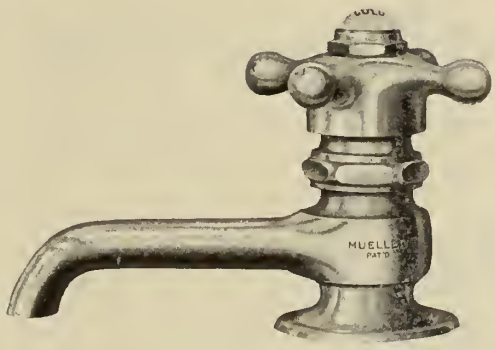
Made of high grade red brass, with careful attention to coring, machining, polishing, and nickel-plating.

A-1501

A-1506

A-1507

A-1502


A-1500

A-1503

MUELLER

Ball Cocks, Basin Cocks, Bath Cocks, Bath Combinations, Bath Bibbs, Globe, Angle and Check Valves, Service Clamps, Corporation Stop Cocks, Couplings, Etc.

A-1504

A-1505

MUELLER

Gas and Water Drilling Machines, Drinking Fountains, Gas Cocks, Lavatory Combinations, Service Boxes, Reducing and Regulating Valves, Etc.

ALL GOODS TESTED UNDER
200-POUND HYDRAULIC PRESSURE

H. MUELLER MFG. CO., LTD.
SARNIA CANADA

Send for our Canadian Catalogue "A"

MANUFACTURERS OF HIGH GRADE MUELLER WATER PLUMBING AND GAS BRASS GOODS

to large orders booked in the spring, are able to procure small shipments from the mills and claim if it were not for these small shipments they would be completely tied up. It is believed that generally warehouse stocks are exhausted and shipments on coming in are practically delivered from the car and thus no stocks are able to trickle through to the warehouses. The following are the current quotations:

BLACK SHEETS—

14 gauge	5 45	6 50
16 gauge	5 90	6 95
18-20 gauge	5 45	6 85
22-24 gauge	6 50	6 90
26 gauge	6 60	6 95
28 gauge	6 75	7 05
3-16 inch plate	5 20	5 55
¼-inch boiler plate	4 80	6 10

Prices shown are for full cases. An extra charge of from 25c per 100 lbs. is made for less than case lots.

GALVANIZED SHEETS.

	Premier		Apollo	
10¾ oz.	$9 20	$9 80	$8 55	$9 55
U.S. 28	8 60	10 20	8 15	8 85
U.S. 26	8 20	8 80	7 85	8 50
22 and 24	8 00	8 20	7 70	7 30
18 and 20	7 80	8 00	7 55	8 10
16	7 55	7 80	7 40	7 90
12 and 14	7 35	7 55	7 25	7 65

An extra is now charged on galvanized sheets, 10¾ oz. and 28 ga., when shipped out in sheets 3 feet wide. The extra charged over prices shown above is 20c per 100 pounds. Other gauges show no change for different widths.

Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

Firmer is Iron and Steel; Other Scrap Weaker

SCRAP AND WASTE MATERIALS.—Scrap iron and steel, especially of the better grades, are showing stronger tendencies, and higher prices would be in order according to present indications. Copper, lead, zinc, etc., are showing weaker tendencies and are depending considerably on conditions, whether they advance or show further declines. The market for old boots, rubbers, etc., is very quiet. The following is the revised price list:

DEALERS' BUYING PRICES

Tea lead	0 03½
Heavy lead pipe	0 05¾
Pipe scrap	10 00
Stove plate, per ton	17 50
No. 2 busheling	11 00
Yellow brass	0 10
Red brass	0 15¾
Light brass	0 07
Scrap zinc	0 06
Heavy copper	0 17
Wrought iron, No. 1, per gr. ton	14 00
No. 1 machinery cast	22 00
Heavy melting steel	14 00
Old rubbers, boots and shoes	0 06
Overseas, lumbermen's rubber boots	0 04
Bicycle tires	0 01½
Automobile tires	0 03
Tea lead	0 03½
Heavy lead pipe	0 05¾

Demand Continues For Range Boilers

RANGE BOILERS are holding firm and so far the situation is a steady one. Owing, no doubt, to the increasing demand for houses and the large number being rushed to completion to supply this demand is, no doubt, the cause of the good volume of business already handled. Many of these houses are still under construction, assuring continued demand for some time to come. Quotations are as follows:

Range Boilers	Standard	Extra Heavy
30-gallon	$11 00	$12 50
35-gallon	13 50	15 50
40-gallon	15 25	17 25
52-gallon	20 60	25 00
66-gallon	32 00	38 00
82-gallon	40 00	47 00
100-gallon	50 00	58 00
120-gallon	60 00	67 00

Boiler Tubes Remain Unchanged

BOILER TUBES.—No business is being turned down in the line, although tubes are reported to be very scarce. The shipments coming in are fair, although the new freight rules, if effective, may be a factor in changing the price, as more perishable goods will be given the preference. It is expected this will have a tendency to make the scarcity more pronounced. The following are quotations:

BOILER TUBES—	Per 100 feet Seamless	Lapweld
1 inch	$27 00	.....
1¼ inch	29 00	.....
1½ inch	29 50	.....
1¾ inch	32 00	$27 00
2 inch	31 00	26 00
2¼ inch	35 00	28 00
2½ inch	43 00	32 00
3 inch	48 00	40 00
3¼ inch	.....	47 00
3½ inch	60 00	44 00
4 inch	75 00	56 00

Enamelware Firm; No Change Noted

ENAMELWARE.— The enamelware situation continues to be an active one, the demand continuing very brisk. Manufacturers state, however, that it is only a matter of a short time till they will be caught up again with their orders, as their production is still continuing, and it is expected that the demand will generally ease off, as the cold weather becomes more pronounced. The prices are not expected to change at least for the present, although it is hard to predict on account of so many problems that continue to crop up. The coal crisis, if not soon overcome, will be a factor, more on account of curtailing the freight shipments of both the finished products, as well as coal and cke, etc. The following are the prices on some of the most general lines called for:

Bath tubs, roll rim, 4. 4½, 5 feet, 24 to 30 in. wide	$37 05
Bath tubs, 5½ ft.	41 20
Lavatories—	
17x10" Apron F139 or P4045	11 05
18x24" Apron F154 or P3845 or P3847.	17 00
18x21" Apron F169 or P4205	12 70
18x21" Roll rim F197, F199 or P4655-6	11 10
17x19" Roll rim F241 or P4345	9.05
Sinks, roll rim, 18 x 30 in.	16 60

Sinks, flat rim—	1 only	2 only	3 only
16 x 24	$5 40	$5 35	$5 30
18 x 30	6 20	6 50	6 10
20 x 30	7 10	7 05	7 00

Closets, oak tank and seat	26 50
Do., enamel iron or white vitro tank	30 00

Unchanged is Conductor Pipe; Prices Firm

CONDUCTOR PIPE shows no change. The demand is very good, especially in some localities where the winter has as yet not set in, and many are taking advantage of the late season to catch up with deferred orders. Although galvanized sheets are very scarce with firming prices, no advance is expected at present, and prices are quoting as follows:

PIPE (Conductor)

Plain

2 in., in 10-ft. lengths, list	8 00
3 in., in 10- ft. lengths, list	9 70
4 in., in 10-ft. lengths, list	12 80
5 in., in 10-ft. lengths, list	17 50
6 in., in 10-ft. lengths, list	21 30

F.o.b. Toronto, Ottawa, Oshawa.

List less 10%.

Soil Pipe Firm; Prices Unchanged

SOIL PIPE AND FITTINGS.—The demand for soil in some localities continues very strong, considering the season of the year. Some localities report a very open winter so far, the ground being hardly frozen on the surface. In these places advantage is taken of these conditions, creating more than a seasonable demand. However, manufacturers have not slackened up in their production, it is stated, and are trying to overcome and get a surplus ahead in order to take care of the large requirements expected in the spring. Quotations are as follows:

Medium and extra heavy soil pipe, 2, 3 5 and 6 in.	10%
Medium and extra heavy soil pipe, 4 in.	15%
Medium and extra heavy soil pipe fittings, 2 in. to 6 in.	25%
8 in. extra heavy pipe and fittings	5%

PIPE FITTINGS

Cast iron fittings	10%
Plugs	22%
Bushings	25%
Unions, ¼" to 2½"	40%
Do., ⅛", 3" and larger	35%
Dart unions, ¼-inch to 2-inch	25%
Do., 2½-inch and larger	15%
Nipples, up to 4 inch	75%
Do., 4½-inch and larger	65%
Do., running thread 4-in. and under	45%
Couplings, 4-in. and under	40%
Do., 4½-in. and larger	20%

MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittings, Class A, lb.	$0 57	$0 72
Do., Class B, lb. net	0 25	0 35
Do., Class C, lb. net	0 19	0 25

Continued on page 35

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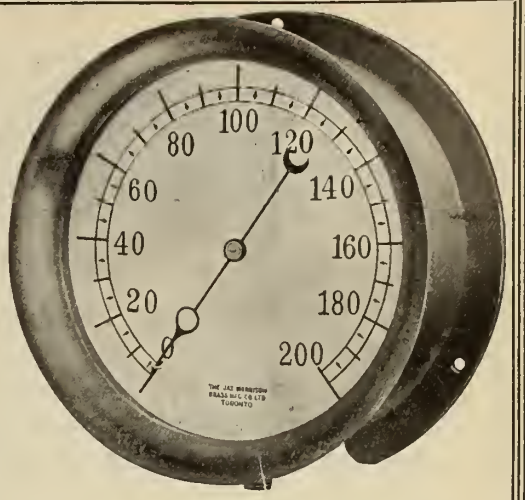

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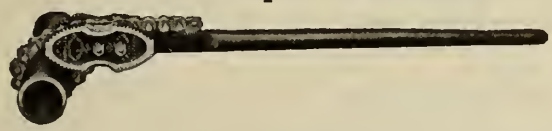

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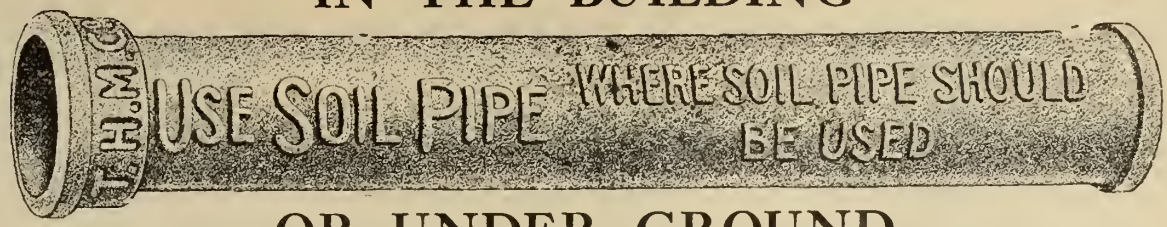

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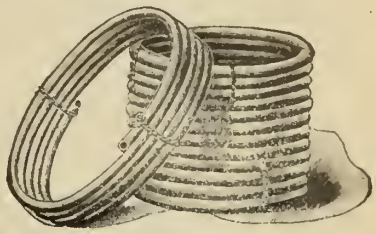

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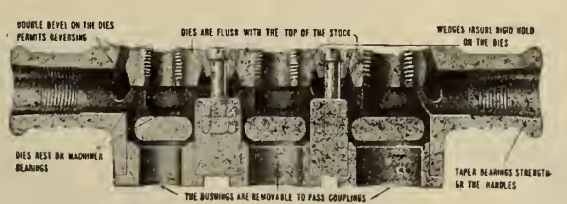
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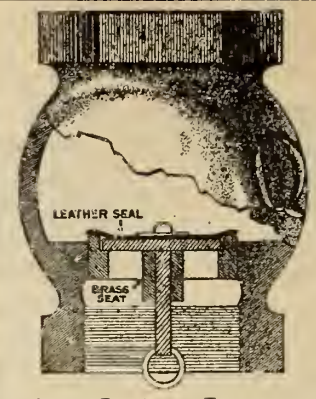

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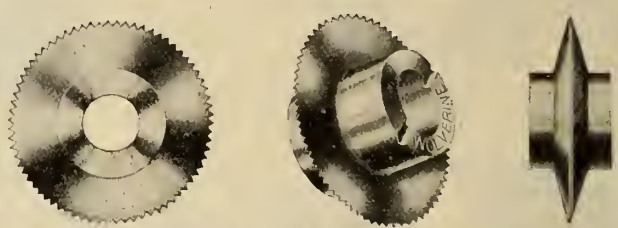

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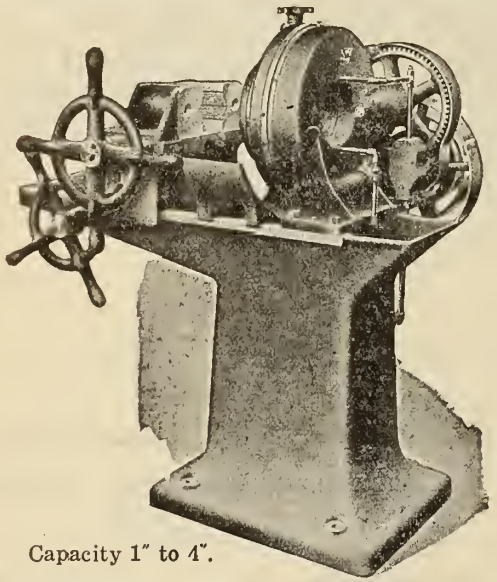

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All Sizes of NIPPLES (Black and Galvanized)

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INDEX TO ADVERTISERS

Allison, K. B. 46
Amherst Foundry Co. ..... Inside Front Cover
Anthes Foundry Co. 9
Armstrong Mfg. Co. 48

Beaton & Cadwell 47
Beaton & Corbin 48
Buffalo Specialty Co. 1

Canada Metal Co. 11
Canadian Brass Co. 5
Canadian Society of Domestic and Sanitary Engineers 4
Canadian Consolidated Rubber Co. 44
Canadian Tube & Iron Co. 46
Chamberlain Desolvo Co. 47
Commercial India Rubber Co. 48

Dunham, C. A., Co., Ltd. 3

Empire Manufacturing Co. ..... Outside Front Cover

Fittings Limited 43

Galt Brass Co. ..... Back Cover
Gurney Foundry Co., Ltd. 48

Hall, J. H. 46
Hamilton Stove & Heater Co. 38
Hause Mfg. Co., Chas. F. 48
Hoyt Metal Co. 41

International Malleable Iron Co. ..... Inside Back Cover

Jardine, A. B., & Co. 6
Jenkins Bros., Ltd. 6

Katie Foundry, The 45
Kerr Eng. Co., Ltd. ..... Inside Back Cover

Long, R. G., & Co. 46

McDougall & Co., R. 44
McIntyre & Taylor, Ltd. 39
Modern Heating & Engineering 7
Moline Heat 7
Morrison Brass Mfg. Co., Ltd., Jas. 39
Mueller Mfg. Co. 37

National Steel Tank & Mfg. Co. 45

Port Hope Sanitary Mfg. Co. 24-25

Scaife & Sons Co., Wm. B. 45
Standard Sanitary Mfg. Co. 2
Steel & Radiation, Limited 8
Sturtevant, B. T., Co. 12

Trimont Manufacturing Co. 48
Toronto Hardware Mfg. Co. 41

United Brass Founders & Engineers, Ltd. 9

Wallaceburg Brass & Iron Co. 8
Warden-King, Limited 3
Wells Bros. Co. of Canada, Ltd. 41
Williams, J. H., & Co. 39
Wolverine, Ltd. 44

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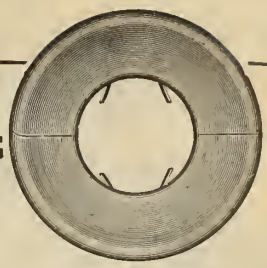

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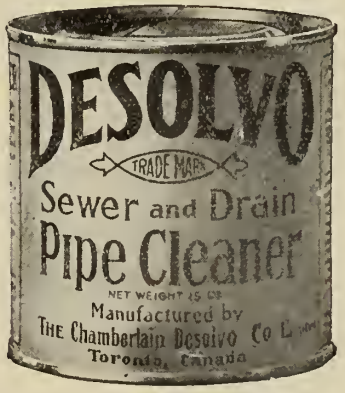

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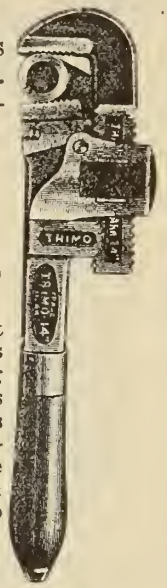

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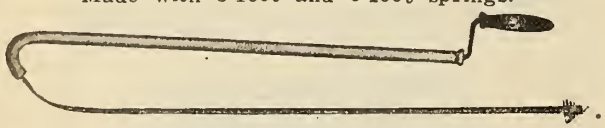

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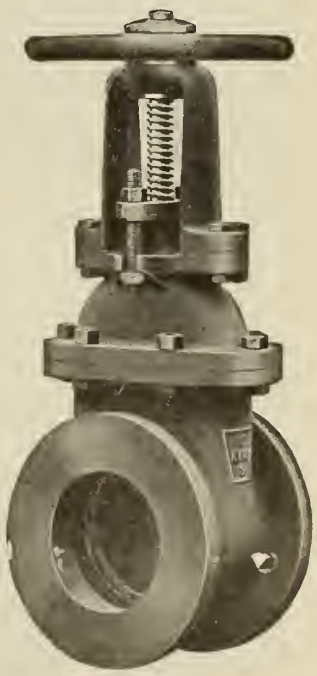

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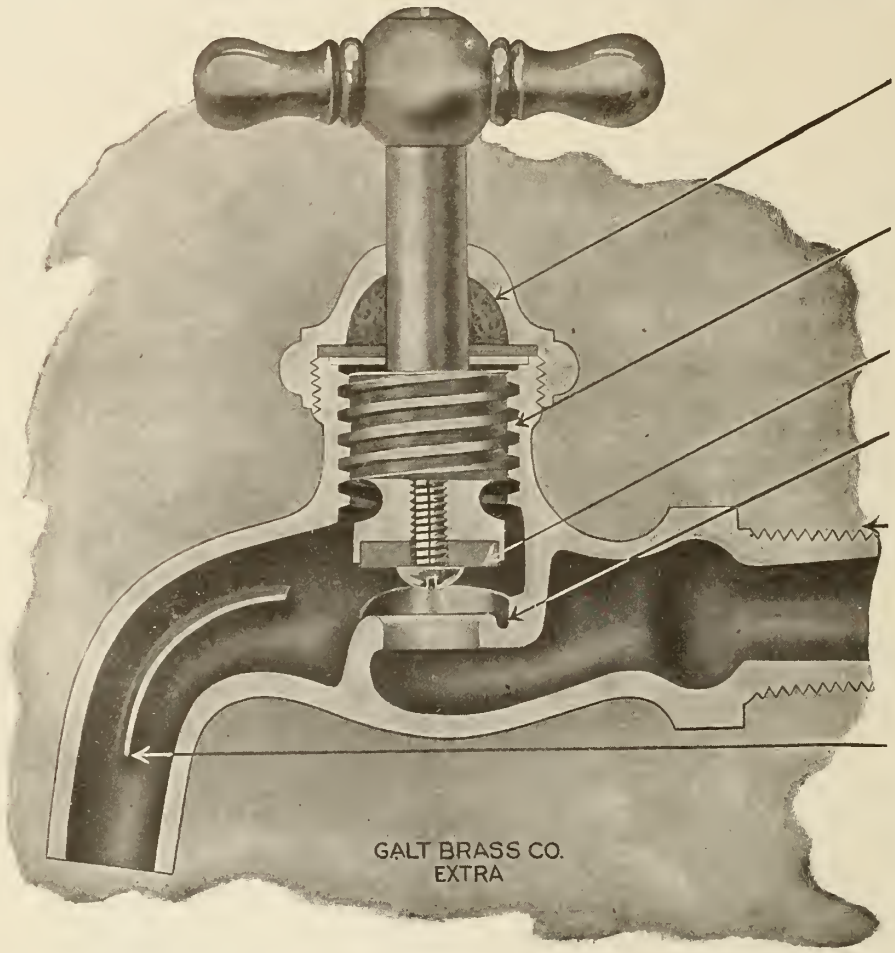

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Sanitary Engineer

Plumber and Steamfitter of Canada

VOL. XIII. PUBLICATION OFFICE, TORONTO, DECEMBER 15, 1919 No. 24

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OUR Christmas Wish to all Sanitary and Heating Engineers in Canada is that the coming year may be one of Unprecedented Prosperity.

We thank you for your business of the past year and give you our assurance of the same satisfactory service in the future.

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A HIGH-GRADE LAVATORY THAT CANNOT BE SURPASSED

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Tinker Tom Talk No. 237

Make Others Happy —

They'll Make You Happy

and

Happy Christmas

Will Prevail

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Greetings to the plumbing trade of Canada

This season will indeed be a festival of peace and good-will, finding deep echo in the hearts of all of us.

May peace and happiness be yours this Christmas time, and may the New Year, upon whose threshold we stand, bring you increased prosperity and witness the culmination of many a long cherished desire.

Anthes Foundry Co., Limited
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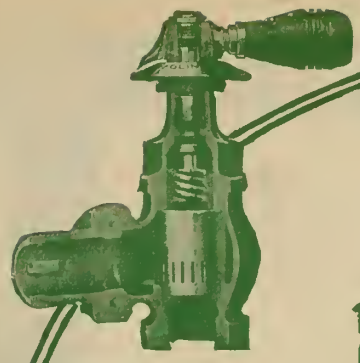

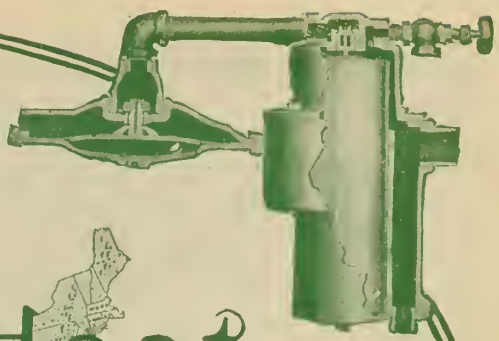

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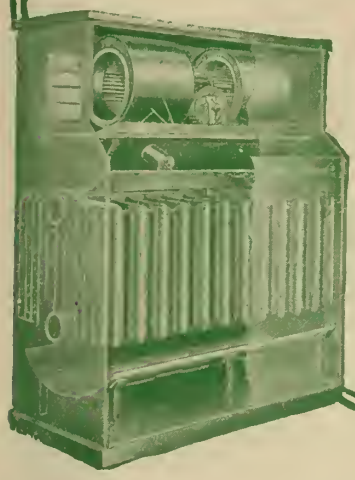

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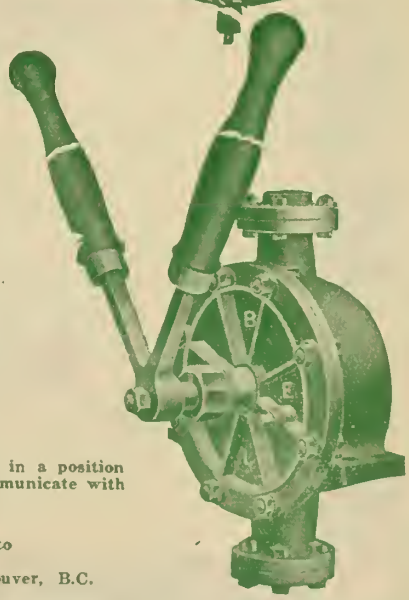

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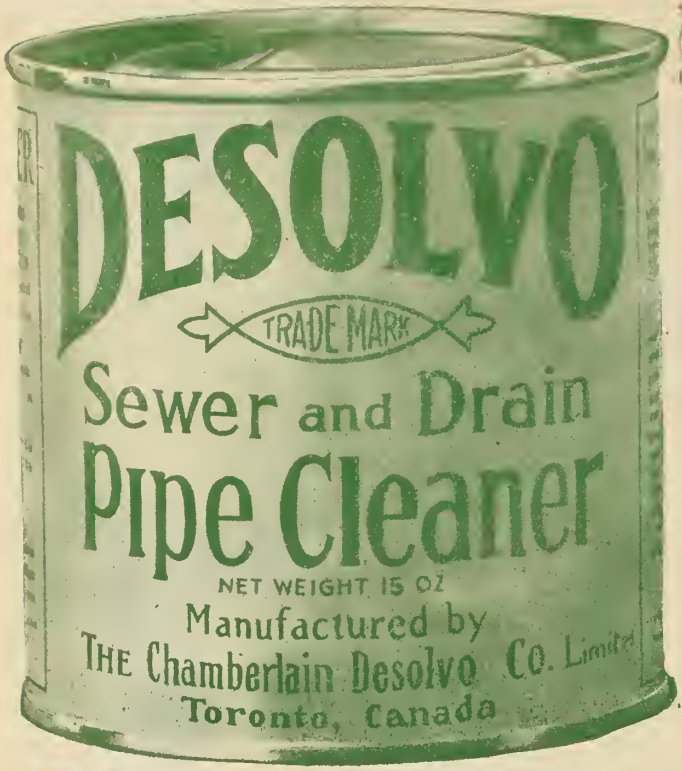

THAT you may have a Merry Christmas and A Happy and Prosperous New Year is the sincere wish of the

Chamberlain Desolvo Co., Ltd.
Toronto

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A Merry Christmas be Yours

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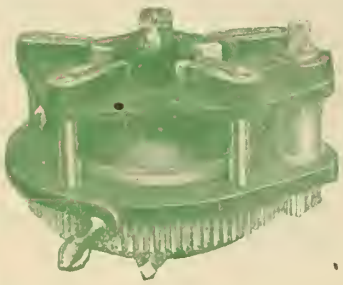
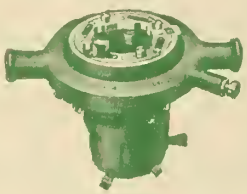


Xmas
1919



Wish You A
Merry Christmas
and a
Happy and Prosperous
New Year

A. B. Jardine & Co., Limited
HESPELER, ONTARIO

THE

WALLACEBURG

BRASS & IRON MFG. CO.

LIMITED

Extend to you their best wishes for a bright and prosperous New Year.

Merry Christmas

comes to us from the old days of Merry England when everybody from Robin Hood and his robber band to King, Baron, Retainer and Serf did their best to lend a hand, submerge self and tried to make the Yuletide festival a real heartfelt joy.

If we can carry this wonderful message of **SERVICE** to others, this Christmas will be a merry one indeed.

A Happy New Year

can be made continuous throughout its entire twelve months if we will but plan and organize our activities to give the best that is in our power, knowing that true efforts for good work or good living bring their reward in real happiness, both mental and material.

We Wish Our Many Clients and Friends

The Compliments of the Season

Canadian Brass Co.

Galt, Ontario

WOLVERINE
—LIMITED—

Wishes You and Yours

A Merry Christmas, 1919

For your patronage during 1919, for the confidence and support which you have extended to—Wolverine Limited and their Quality Products—we sincerely thank you and we cordially wish you a joyful and prosperous New Year for 1920.

Yours for Service

WOLVERINE
—LIMITED—

TORONTO

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SANITARY ENGINEER

PLUMBER AND STEAMFITTER OF CANADA

ESTABLISHED 1907 PUBLISHED TWICE MONTHLY

Vol. XIII. TORONTO, DECEMBER 15, 1919 No. 24

CONTENTS

Ontario's Proposed New Regulations	13-19
A New Series for the New Year	19
Editorial Comment	20-21
News From Here and There	22-23
What Will Happen When Prices Decline?	26
Montreal Plumbers Look for Brisk 1920	27
Sees Record Business Coming	28
Great Activity Looked for in Building	29
Keep Your Stock Well Displayed	30
Prosperity Assured for Years to Come	31-32
Ventilating the Modern School	33-35
Market Conditions and Tendencies	36-38

The MacLean Publishing Company, Ltd.

JOHN BAYNE MACLEAN, *President.* H. T. HUNTER, *Vice-President.*
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Our Wish to the Trade is a

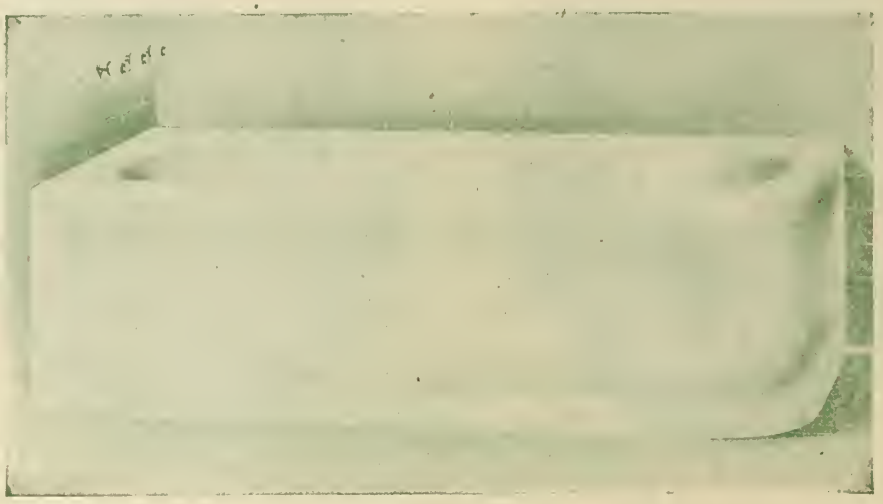
Happy, Prosperous New Year

The Canada Metal Co., Limited, Toronto

HAMILTON MONTREAL WINNIPEG VANCOUVER

"Standard"
"Perfection" Built-in Baths

Made in One Piece Enamelled All Over



These Baths represent the last word in design and finish, and are made to build into Right or Left Hand Corner or into a Recess.

The "Perfection" Built-in-Bath is only 17½ inches high, therefore convenient. It builds into walls and floors, the absence of all dust-collecting cracks and corners meaning bathroom sanitation.

Made in 5 and 5½ foot sizes.

Illustrations on request.

Write the nearest dealer

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Established 1907 Circulates Throughout Canada

Sanitary Engineer
Plumber and Steamfitter of Canada

Published First and Fifteenth of Month

Vol. XIII. TORONTO, DECEMBER 15, 1919 No. 24

Ontario's Proposed New Regulations

Regarded by Men in the Trade as the Longest Step Forward That Has Ever Been Taken in Canada—Proposed By-laws Are Based Absolutely on "Good Practice" and Make for Standardization

ONTARIO'S PROPOSED REGULATIONS

SANITARY ENGINEER is the first publication to present the much talked of and long discussed proposed new plumbing regulations for the Province of Ontario.

While these by-laws have not as yet become effective, they await only the signature of the Lieutenant-Governor of the Province to become law. This, it is understood, will be attached very shortly.

The regulations are regarded by the men in the trade as the greatest step forward that has ever been made in Canada in connection with plumbing matters.

A very important matter in connection with them is that they are based entirely on "good practice" and not on theory. In addition they are not any one man's idea of "good practice," but embody the actual experience of some of the best men in the trade.

In presenting the accompanying matter to its readers, SANITARY ENGINEER urges a careful perusal of the regulations as they are of real importance to every sanitary and heating engineer in the Dominion.

EXTRACT ONTARIO STATUTES

(Chap. 192.)

399. By-laws may be passed by the councils of local municipalities.

(10) For regulating the construction of cellars, sinks, cesspools, water closets, earth closets, privies and privy vaults; for requiring and regulating the manner of the draining, cleaning and clearing and disposing of the contents of them.

(11) For requiring the use, within the municipality or a defined area of it, of dry earth closets.

(12) For providing that the cleaning and disposing of the contents of cesspools, water closets, earth closets, privies and privy vaults shall be done exclusively by the corporation.

(*a*) For such purpose the corporation, its officers and servants shall have all the powers of the local board of health and its officers and servants, and such expense shall be recoverable in the manner provided by section 500.

(13) For the requiring and regulating the filling up, draining, cleaning, clearing of any grounds, yards and vacant lots and the altering, relaying or repairing of private drains

(14) For making any other regulations for sewerage or drainage that may be deemed necessary for sanitary purposes.

(68) For requiring owners, lessees and occupants of land in the municipality or any defined area of it to close or fill up water closets, privies, privy vaults, wells or cesspools, the continuance of which may, in the opinion of the Council or Medical Health Office, be dangerous to health.

(71) For the closing or filling up of public or private wells.

(72) For compelling the use within the Municipality or any defined area therein, for drinking and domestic purposes, of water supplied from the waterworks of the Municipality or of a waterworks company; and for prohibiting the use within the municipality of such area of spring or well water for such purposes.

420. By-laws may be passed by the councils of towns, townships, villages and cities, having a population of less than 100,000 and by Board of Commissioner of Police in cities having a population of not less than 100,000.

(4) For licensing, regulating and governing plumbers, master plumbers and journeyman plumbers:

(*a*) For the purpose of this paragraph "master plumber" shall mean a person who is skilled in the planning, superintending and installation of plumbing, is familiar with the laws, rules and regulations governing the same, has a regular place of business in the municipality and who himself or by journeymen plumbers in his employ performs plumbing work.

(*b*) A "journeyman plumber" shall mean a person other than a master plumber who has been in the employ of a master plumber for not less than one year and desires to follow plumbing as his calling.

500. Where a council has authority to direct or require by by-law or otherwise that any matter or thing be done, the council may by the same or by another by-law direct that in default of it being done by the person directed or required to do it, such matter or thing shall be done at his expense, and the corporation may recover the expense incurred in doing it by action, or the same may be recovered in like manner as municipal taxes. 3-4 Geo. V. c. 43, s. 500.

Chapter 204

Sec. 8.—(3) Persons supplied with water by the corporation may be required to place only such taps for drawing and shutting off the water as are approved of by the corporation. 3-4 Geo. V. c. 41, s. 8.

Sec. 13.—The corporation may pass by-laws for regulating the time, manner, extent and nature of the supply by the works, the building or persons to which and to whom the water shall be furnished, the price to be paid therefor, and every other matter or thing related to or connected therewith which it may be necessary or proper to regulate, in order to secure to the inhabitants of the municipality a continued and abundant supply of pure and wholesome water, and to prevent the practising of frauds upon the corporation with regard to the water so supplied, and for providing that for a contravention of any such by-law the offender shall incur a penalty not exceeding $20 or may be imprisoned without the option of a fine for any period not exceeding one month, and the provisions of The Ontario Summary Convictions Act shall apply to a prosecution under this section. 3-4 Geo. V. c. 41, s. 13.

Sec. 14.—Every person who

(*b*) wilfully lets off or discharges water so that the same runs wasted or useless out of the works;

(*c*) being a tenant, occupant, or inmate of any house, building or other place supplied with water from the waterworks, lends, sells, or disposes of the water, gives it away, permits it to be taken or carried away, uses it or applies it to the use or benefit of another, or to any use and benefit other than his own, increases the supply of water agreed for, or improperly wastes the water;

(*f*) wilfully alters any meter placed upon any service pipe or connected therewith, within or without any building or other place, so as to lessen or alter the amount of water registered;

(*g*) lays or causes to be laid any pipe or main to communicate with any pipe or main of the waterworks, or in any way obtains or uses the water without the consent of the corporation;

shall for every such offence incur a penalty not exceeding $20 or may be imprisoned, without the option of a fine, for any term not exceeding one month, and the provisions of The Ontario Summary Convictions Act shall apply to a prosecution under this section 3-4 Geo. V. c. 41, s. 14.

Chaper 229

Sec. 41.—(1) The owner of every building used as a factory, shop or office building shall

(*a*) provide a sufficient number and description of privies, earth or water closets and urinals for the employees of such factory, shop or office building, including separate sets for the use of male and female employees with separate approaches thereto, one closet for every twenty-five persons of each sex employed in the factory, shop or office building and shall keep at the entrance to such closet a clearly painted sign indicating for which sex the closets are provided;

(*b*) be responsible for the remedying of any effluvia arising from any drain or defective plumbing and for any repairs required to keep the building in a safe and habitable condition;

(*c*) arrange for a supply of pure drinking water available for each occupier.

(2) The Lieutenant-Governor in Council may prescribe such additional regulations with respect to such conveniences as may be deemed proper.

(3) The owner of every factory, shop or office building who for thirty days, or such extended period as the inspector in writing allows, refuses or neglects to comply with the requirements of sub-section 1 or of the Regulations after being notified in writing in regard to the same by the Inspector, shall incur a penalty of not more than $500 and in default of payment shall be liable to imprisonment for any period of not more than 12 months. 3-4 Geo. V. c. 60, s. 41.

Sec. (43) (1) The employer of every factory or shop shall

(*b*) Keep privies, earth or water closets and urinals in good repair and in a sanitary condition, and keep closets separated for male and female employees, and provide conveniences to the satisfaction of the Inspector for the employees using them;

(*f*) Provide a wash-room, clean towels, soap and a sufficient supply of wholesome drinking water and proper drinking cups for employees, and water taps which shall be at least eight feet distant from any water-closet or urinal, and also, in the case of a foundry, shower baths for the employees. 3-4 Geo. V. c. 60, s. 43.

Sec. (44) Every employer of an office shall

(2) Where in an office building the privies, closets or urinals or other conveniences are not situate in that part of the building occupied by and under the control of the employer it shall be the duty of the owner, and where such conveniences are situate in that part of the building occupied by and under the control of a separate employer, it shall be the duty of such employer to keep the same in good repair and in a sanitary condition.

(3) The owner of every office building shall at all times keep the same or such parts thereof as are used in common by the tenants or occupants thereof and are under his control in a clean and sanitary condition, and so as not to be injurious to the health of persons employed in the building or using or having access to the same.

(4) Every owner or employer who, for thirty days or for such extended period as the Inspector allows, refuses or neglects to comply with the requirements of this section after being notified in writing in regard to the same by the Inspector shall incur a penalty not exceeding $500 and in default of payment shall be liable to imprisonment for any period of not more than twelve months. 3-4 Geo. V. 60, s. 44.

Sec. 64.—(1) Every bake shop which is not within the provisions of this part relating to factories or shops shall be provided with a proper wash-room and a sufficient supply of clean towels and soap, and a closet and other conveniences for the health and comfort of the persons employed therein.

(2) The wash-room, closet and other conveniences shall be separate from the bake-shop and shall be kept clean and in a sanitary condition. 3-4 Geo. V. c. 60, s. 64.

Chapter 256

Sec. 254.—(1) Every street railway company and incline railway company shall, within six months after being so ordered by the Board (The Ontario Railway and Municipal Board) provide, furnish and thereafter maintain suitable and sanitary urinals and other conveniences for the use of the employees of the company operating its cars.

(2) Such urinals and other conveniences may be located upon land owned or provided by the company and reasonably accessible to each of the lines of the railway operated by the company, and at such points as the board may direct, within the limits of the city or town, and the employees of the company shall be allowed reasonable opportunity of access thereto.

(3) The company shall incur a penalty of $10 per day for each day upon which it neglects to provide such urinals or other conveniences.

(4) The Board shall determine whether the cost of such urinals and conveniences shall he borne by the company or by the city or town within the limits of which the company's lines are operated, or by both, and if by both the proportions in which

IMPORTANT REGULATIONS

The proposed regulations will apply to all new plumbing throughout the Province of Ontario, whether in cities, towns, villages or rural municipalities.

In future when a farmer wishes to instal plumbing it must be put in with the same thought and care as is bestowed on the work in the residence of any well-governed city.

The responsibility for conformance with this will rest with the plumber, and any work not done in accordance with the regulations will be done at the plumber's risk.

the same shall be borne by them respectively, in case the parties are unable to agree, as may be determined by the board.

(5) The board may order the city or town to provide the site for such urinals or other conveniences, upon such terms as to cost and otherwise as the board may determine.

(6) When so ordered by the board such urinals and conveniences shall be open to the public as well as to the employees of the company, and when so open the board may order the cost of the maintenance of the same to be borne by the city or town and the company in such proportions as may be deemed proper. 3-4 Geo. V. c. 36, s. 254.

255.—(1) The board may order a company to provide sanitary conveniences for the use of passengers on all passenger cars.

(2) This section shall only apply to electric railways that are not street railways, and to steam railways. 3-4 Geo. c. 36, s. 255.

Chapter 218

Sec. 8. The Provincial Board of Health with the approval of the Lieutenant-Governor in Council, may make such regulations as may be deemed necessary for

Regulations as to plumbing

(*dd*) The construction, repair, renewal, alteration and inspection of plumbing, the material to be used in the construction of, and the location of drains, pipes, traps, and other works and appliances forming part of or connected with the plumbing in any building or upon any building or upon any property or in any highway, street, lane or public place, and in any structure or place, whether permanent or temporary, constructed or used thereon or therein. 6 Geo. V. c. 51, s. 8.

Enforcement of sanitary by-laws.

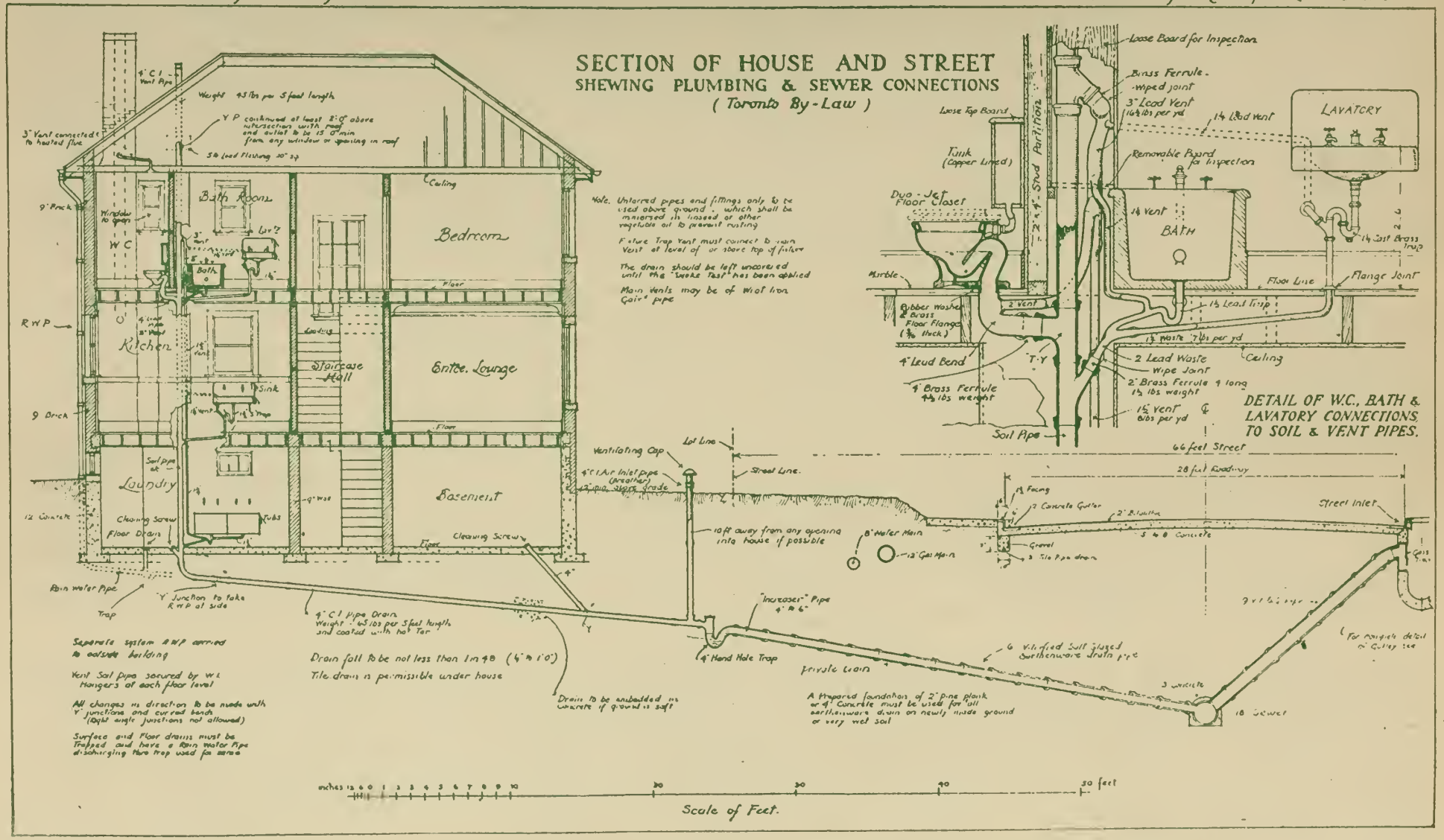
Sec. 13.—(10) The Provincial Board, every district officer of health and inspector, and every medical officer of health and sanitary inspector shall have authority to enforce the by-law set out in Schedule B. or any amendment thereof approved by the Provincial Board, and any by-law respecting the milk supply of, and any other by-law respecting sanitary matters in a municipality, and for this purpose may institute proceedings for the prosecution of offenders against any of the said by-laws. 6 Geo. V. c. 51, s. 13.

Sec. 25. (2) Where a local board in any city recommends that sanitary conveniences should be installed in any building, and is of the opinion that the owner of the premises is unable to pay the expense of the same at once, the municipality may install suitable sanitary conveniences at the expense of the owner, and the board may direct that the cost, including interest at six per centum on the deferred payments, be paid by the owner in equal successive payments extending over a period not exceeding five years, and that such annual payments be added by the clerk of the municipality to the collector's roll and collected in like manner as municipal taxes. 3-4 Geo. V. c. 55, s. 1. Amendment 1917-18.

Sec. 35.—(1) The council of every municipality shall appoint a legally qualified medical practitioner to be the medical officer of health for the municipality, and shall also appoint such number of sanitary inspectors for the municipality as may be deemed necessary by the local board, and as may be prescribed by the regulations.

Sec. 38.—The medical officer of health shall be the executive officer of the local board, and with the local board shall be responsible for the carrying out of the provisions of this Act, and of the Regulations, and of the by-laws of the municipality. 2 Geo. V. c. 58, s. 38.

Sec. 75.—The Medical Officer of Health of any municipality or any inspector or other person in the employ of the local board acting under his instructions, or any member of a local board may enter, inspect and examine at any time of the day or night, as often as he thinks necessary, any premises within the municipality for the purpose of carrying out the provisions of this Act, and may take such action as he deems necessary for carrying out


SECTION OF HOUSE AND STREET
SHEWING PLUMBING & SEWER CONNECTIONS
(Toronto By-Law)
Bath Room
Bedroom
Kitchen
Staircase Hall
Entce. Lounge
Laundry
Basement
W C
Bath
Sink
Tubs
Floor Drain
Cleaning Screw
Ceiling
Floor
9" Brick
12" Concrete
RWP
Rain water Pipe
Trap
Soil pipe
Vent
Weight 45 lbs per 5 foot length
Y P continued at least 2'-0" above intersection with roof and outlet to be 15'-0" min from any window or opening in roof
3" Vent connected to heated flue
5 lb Lead Flashing 20" sq
Note. Unlined pipes and fittings only to be used above ground, which shall be painted in linseed or other vegetable oil to prevent rusting
Fixture Trap Vent must connect to main Vent at level of or above top of fixture
The drain should be left uncovered until the "Smoke Test" has been applied
Main Vents may be of Wrot Iron Galv'd pipe
Separate system R W P carried to outside building
Vent Soil Pipe secured by W I Hangers at each floor level
All changes in direction to be made with Y junctions and curved bends (Right angle junctions not allowed)
Surface and Floor drains must be Trapped and have a Rain water Pipe discharging Here trap used for same
4" C I Pipe Drain Weight 16 lbs per 5 foot length and coated with hot Tar
Drain fall To be not less than 1 in 48 (4" in 16'-0")
Tile drain is permissible under house
Drain to be embedded in concrete if ground is soft
"Increaser" Pipe 4" to 6"
4" Hand Hole Trap
Private Drain
A Prepared foundation of 2" pine plank or 4" Concrete must be used for all earthenware drain on newly made ground or very wet soil
6" V.I. fired Salt glazed Earthenware drain pipe
3 Concrete
18" Sewer
Ventilating Cap
4" C I Air Inlet pipe (Breather)
1/4 pipe steps Grade
Lot Line
Street Line.
10 ft away from any opening into house if possible
8" Water Main
12" Gas Main
66 feet Street
28 foot Roadway
1/4 Facing
2" Concrete Gutter
2" Binder
5 to 8 Concrete
Gravel
3" Tile Pipe drain
Street Inlet
For height detail of Gutter see
Loose Board for Inspection
Brass Ferrule - wiped joint
3" Lead Vent (16 1/2 lbs per yd
1 1/4 Lead Vent
Loose Top Board
Tank (Copper Lined)
Removable Board for Inspection
Duo-Jet Floor Closet
2'-4" Stud Partition
1 1/4 Vent
BATH
LAVATORY
1 1/4 Lead Trap
1 1/4 Waste 7 lbs per yd
Floor Line
Flange Joint
Marble
Rubber Washer
Brass Floor Flange (1/16 thick)
2 Vent
4" Lead Bend
T-Y
4" Brass Ferrule 4 1/2 lbs weight
2 Lead Waste
Wipe Joint
2" Brass Ferrule 9 long 1 1/2 lbs weight
1 1/2" Vent 6 lbs per yd
Soil Pipe
DETAIL OF W.C., BATH & LAVATORY CONNECTIONS TO SOIL & VENT PIPES.
inches 12 6 0 1 2 3 4 5 6 7 8 9 10
20
30
40
50 feet
Scale of Feet.

The illustration shows the requirements for plumbing and sewer connections under Toronto by-laws, approved by the Provincial Board of Health. These are included in the proposed new general regulations for the entire Province. In actual practice it is stated these requirements have stood up well and their adoption for the needs of other communities is expected to help solve many problems.

the said provisions, and any person in charge of such premises for the time being shall render such aid to the Medical Officer of Health or other person as may be necessary to make such inspection or examination. 6 Geo. V. c. 51, s. 75.

Sec. 115.—(3) The by-law set out in Schedule B and any amendment thereof approved by the Provincial Board shall have the same force and authority as a regulation made under this Act by the Provincial Board. 6 Geo. V. c. 51, s. 115.

Regulations of the Provincial Board of Health

Sections, 14, 15, 16, 17, 23, 24, 25, 26, 27, 28 of Schedule "B," Public Health Act, are repealed and the following statutory by-law is inserted as an amendment to Schedule "B," hereafter referred to as "Regulations as to Plumbing, etc."

1. The amending by-law shall take effect and be in force in every municipality of the Province of Ontario from and after November 1st, 1919.

2. These regulations shall be held to include and govern all work done and materials used (1) in introducing, maintaining, and extending a supply of water through a pipe or pipes, or any appurtenance thereof, in any building, lot, premises or establishment; (2) in connection with any system of sewage disposal by means of septic tank, cesspit, dry-earth closet, subsoil irrigation or otherwise; (3) in connecting or repairing any system of drainage whereby foul, waste, or surplus water, gas, vapour, or other fluid is discharged or proposed to be discharged through a pipe or pipes from any building, lot, premises, or establishment into any public or private sewer, drain, pit, box, filter-bed, or other receptacle, or into any natural or artificial water-course flowing through public or private property; (4) in ventilating any house sewer or any fixture or appurtenance connected therewith; (5) in excavating in any public or private street, avenue, highway, road, court, alley, or space, for the purpose of connecting any building, lot, premises or establishment with any service pipe, house connection, water main, sewer, gas main, or other underground structure; and generally (6) in performing all classes of work usually done by plumbers; and it shall be unlawful for any person or persons, firm or corporation to do or have done any work in connection with the plumbing and drainage of any premises, both public and private hereafter constructed, or at present in the course of construction, and any and all additions to, alterations in extension or reconstruction of any plumbing and drainage system that do not conform with the following and any regulations as to plumbing which are or shall be, from time to time, in force in any municipality or unorganized territory of the Province of Ontario.

Sanitary Conveniences

3. Every enclosure containing one or more water-closets shall be provided with adequate ventilation to the outer air, either by window or by suitable light shaft.

4. In every tenement or apartment house hereafter erected there shall be a separate water-closet in a separate compartment within each apartment of four or more rooms. Where apartment consists of less than four rooms there shall be at least one water-closet for every three rooms,, and on the same floor with said rooms. Every such water-closet shall be placed in a compartment completely separated from every other water-closet, such compartment shall not be less than two feet four inches wide, and shall be enclosed with plastered partitions, or some equally substantial materials which will extend to the ceiling. Such compartments shall have a window, opening directly or through a straight horizontal shaft of the same dimensions as the window and not more than four feet long, upon a street, a railroad right-of-way, cemetery or public park or a yard or alley or open passageway not less than four feet wide, or upon a vent court or upon a covered passageway not more than twenty feet long and at least twenty feet wide, and twenty feet high. Every such window shall be at least one foot by three feet between stop beads; and the entire window shall be made so as to readily open. When, however, such water-closet compartment is located in the top floor and is lighted and ventilated by a skylight over it, no window shall be necessary, provided the roof of such skylight contains at least three square feet of glazed surface and is arranged so as to readily open. Nothing in this section in regard to the separation of water-closet compartments from each other shall apply to a general toilet room containing several water-closets, hereafter placed in a tenement house, provided such water-closets are supplemental to the water-closet accommodations required by law for the use of the tenants of the said house. Nothing in this section in regard to the ventilation of water-closet compartments shall apply to a water-closet hereafter placed in an existing tenement house, where it is provided to replace a defective fixture in the same position and location.

5. A dwelling house made into apartments, whether the same approached by a common stairway or otherwise, shall, for the purpose of these regulations, be classed as an apartment house.

6. In the case of a rooming or lodging house there shall be at least one water-closet on each floor on which lodging chambers are let.

7. In the case of construction or boarding camps there shall be not less than one sanitary convenience for each thirty persons, and in no case less than two conveniences to each camp.

8. Every contractor, builder, architect or owner employing or in charge of any men engaged in the erection of buildings or the construction of public or private works of any kind, shall provide, for the use of the workmen employed upon such building or works, suitable temporary conveniences.

9. No person shall construct or maintain any system of disposal of excremental matter or sewage by means of a septic-tank, cesspit, dry earth closet or by broad irrigation, sub-soil irrigation or otherwise, except upon a permit issued by the Local Board of Health of the municipality wherein it is proposed such system be situated. Application for it shall be made in writing to the Local Board of Health and shall be accompanied by a detailed description of the system and its location on the premises of said applicant.

10. The Local Board of Health of every urban municipality shall, upon a map of the municipality set aside for that purpose, locate all privies, cesspits and dry earth closets and other systems for the disposal of human excrement, and shall revise the same yearly.

11. All septic tanks, privies,, cesspits and dry earth closets and other systems, shall be so constructed, screened and maintained that flies neither find access thereto nor breed therein.

12. Dry earth closets shall be provided with water-tight receptacles.

13. Every such earth closet shall be constructed so that adequate access may be had thereto for the purpose of cleansing every part thereof.

14. Every person who shall construct an earth closet in or in connection with a building shall provide, construct, or fix in connection with such earth closet suitable means of apparatus for the frequent and effectual application of dry earth, ashes or other deodorizing substance to any filth which may from time to time be deposited in the receptacle of such earth closet.

15. Every year, during the period from the 1st day of May to the 1st day of October, the contents of every dry earth closet shall be removed with sufficient frequency to prevent the breeding of flies. And the Medical Officer of Health shall define the intervals between each cleaning.

16. No person shall engage in the business of transportation of nightsoil or any other offensive or noxious substance, or drive any cart for such purpose in any urban municipality without a permit from the Local Board of Health of the same municipality.

17. No cart or other vehicle for carrying any night-soil or any other offensive or noxious substance or the contents of any privy, vault or cesspit, shall without necessity thereof be allowed to stand or remain before or near any building, place of business or other premises where any person may be; nor shall any such cart or vehicle be allowed to occupy an unreasonable length of time in loading or unloading or in passing along any street or through any inhabited place or grounds.

18. Such carts, vehicles and all implements used in connection therewith must be kept in an inoffensive and sanitary condition, and when not in use shall be stored and kept in some place where no needless offence shall he given to any person.

19. All night-soil and the contents of privies, vaults and cesspits, and all noxious substances, shall, before their removal or exposure, be disinfected and rendered inoffensive by the owner, lessee or occupant of the premises where the same are or by the contractor who removes or is about to remove the same; and no part of the contents of any vault, privy, sink or cesspool shall be removed without a permit from the Local Board of Health.

20. No privy vault, cesspit or dry earth closet shall be allowed to exist within those premises abutting on streets which have sewerage facilities, or upon those premises which, by reason of their situation, may connect to existing sewers where a public sewer is accessible within 150 feet of the same, and all such privies, cesspits and dry earth closets are hereby declared a nuisance within the meaning of Section 73 of the Public Health Act.

21. Where the Local Board of Health or Engineer is satisfied upon the due examination of a building that connection may be had within 150 feet to the sewers of the municipality, and so reports, the same must be made within thirty days after written notice thereof has been given to the lessee, owner or occupant of such premises, and the existing privy, cesspit or dry earth closet shall be cleaned, filled, removed or destroyed, within a period of ten days after connection has been made to the water and sewerage system.

22 In case any owner or tenant or lessee of any property refuses or neglects to carry out an order as provided for by these regulations upon due notice being given, the Local Board of Health of the municipality

MAKES FOR STANDARDIZATION

Another long step forward is achieved in the proposed new regulations in connection with standardization. A perusal of the by-laws shows that standardization is to be followed out in connection with pipe and also in connection with the weight of fittings.

This phase of the matter may have a very important bearing in not only protecting the public, but in eliminating price cutting by men not particular what materials they use.

where such property is situated may direct that such connections be made to the water works and sewerage system and that such sanitary connections may be installed as necessary in the interests of public health, and that the existing privy, cesspit or dry earth closet shall be cleaned, filled in, removed or destroyed, and the officers of the municipality shall have the right of entrance into the premises of said owner, lessee or tenant of said property for the purpose of carrying out the provisions of these regulations, and shall have the right to add the costs thereof to the Collector's Roll, and collect in like manner with other municipal taxes, and nothing in this clause shall relieve the offender from the penalty provided.

23. In these regulations

"Sewer" shall mean a public or private drain laid in a public or private way and constructed of vitrified clay pipe, brick, cement, or other impervious material with joints properly cemented together by mortar and laid on a continuous grade.

"House connection" shall mean that branch of the sewer provided for the connecting of the sewer with the "house drain" of the individual premises.

"House drain" shall mean that portion of the drainage system which extends through the cellar or basement and unites the "house connection" to the sewer—provided outside the premises—with the soil pipe draining the several fixtures, i.e., the horizontal portion from the soil pipe stack to the outside of the building.

"Soil pipe" shall mean the vertical portion of the drainage system of four inches or more internal diameter communicating with one or more fixtures (i.e., water-closets, urinals, basins, sinks, etc.), and a house drain for the purpose of conveying the discharge from the fixtures to the drain.

"Waste pipes" shall mean those pipes connecting fixtures other than water-closets or batteries of fixtures other than water-closets with the vertical lines of soil pipe for the purpose of conveying the discharge of the fixtures thereto.

"Main vent pipe" shall mean any special pipe or special continuation of any soil pipe provided to ventilate the drainage system and to prevent trap siphonage and back pressure.

"Vent Pipes" shall mean the smaller air pipes carried back from traps to the main vent pipe, or outer air.

"Heated flue" shall mean a pipe or chimney flue heated directly or by artificial means during the winter.

"Fixtures" shall mean any receptacle or outlet placed for the purpose of disposing of waste water, filth or other matter, and connecting with the soil pipe or house drain of a building.

"Y-branch" shall mean a branch set at 45 degrees from main line.

"Repair of leaks" shall mean such repairs as are necessary to protect property, but do not involve any extensive changes in construction.

"Sub-soil drain" (weeping drain) shall mean the tile pipe laid without joints, around the foundation walls of any building, to intercept and provide drainage for sub-soil water.

"Surface drain" shall mean a connection with a drain to allow egress of surface water.

"Premises" shall mean any house, tenement, block, warehouse, school, hotel, theatre, factory or building, either public or private.

"Water department" shall mean the water department or water commission controlling the water supply of any municipality.

"Engineer" shall mean the city, town or municipal engineer of any municipality.

Plumbers to Register

24. No plumber, or domestic sanitary engineer, shall engage in or work at the business of master or employing plumber unless he shall first have duly registered his name and place of business, and no person shall by display of sign or plumbing material, or otherwise, advertise as a plumber unless he shall have been registered or licensed as such. Every master plumber shall conspicuously display his certificate or license within his place of business. Notice of any change in the place of business of a registered or licensed master plumber shall immediately be given by him to the Local Board of Health or Plumbing Inspector.

25. No person or persons other than a registered master plumber, or person in his or their employ, or under his or their supervision, shall alter, repair, or make any connection, with any drain soil, waste, or vent pipe, water connection, gas connection, or any pipe connected therewith, except as provided herein.

Permits, Filing of Plans

26. Every plumber before doing any work in a building, shall, except in a case of repair of leaks, file in the office of the local Board of Health, upon blanks for that purpose, an application for a permit, and a plan or sketch of the work to be performed, and no such work shall be done in any building without a written permit from the Local Board of Health.

Appointment of Plumbing Inspectors

27. The Medical Officer of Health shall, with the approval of the municipal council, appoint or designate such Inspectors of Plumbing as may be necessary for the proper enforcement of these regulations, and all such inspectors may exercise the powers of a Sanitary Inspector for the purpose of these regulations.

28. The Inspector of Plumbing may be the engineer or some person having not less than five years' experience as a journeyman plumber, except in the cases of cities, when a more experienced person may be required.

BASIS OF BY-LAWS

Some of the best men in the business in Ontario have been in consultation in framing the proposed new regulations. They come from all parts of the Province and have had to deal with widely varying problems.

The by-laws are based absolutely on "good practice." In framing them every regard has been had for protecting the health and property of the general public.

Duties of Plumbing Inspectors

29. The Plumbing Inspector, with the approval of the Local Board of Health, shall consider all applications for permits and report thereon.

30. All tests of plumbing shall be made in the presence of a duly appointed inspector.

31. The Plumbing Inspector may exercise the authority conferred on the Local Board of Health and the inspector in these regulations.

Annual Report

32. The Plumbing Inspector of every municipality shall report annually to the Provincial Board of Health as to: (1) The number of licensed plumbers in cities and towns; (2) the number of permits issued; (3) the number of inspections made; (4) the number of premises not connected to sewers, and the number of new premises erected.

Cast Iron Pipe

33. All cast iron pipes, including the hub, used for soil, waste and vent pipes shall weigh not less than the following average weights per length of five feet and shall be sound, cylindrical and smooth, thoroughly coated inside and outside with linseed oil or other coating as the Provincial Board of Health from time to time may approve of. In addition, pipe and fittings to be placed underground shall be coated inside and out with coal tar supplied hot or other coating approved by the Provincial Board.

Weights of Cast Iron for Underground

Diameter of pipe.	Weight per five feet. Lbs.
2 inches	27½
3 "	47½
4 "	65
5 "	85
6 "	100
8 "	135
9 "	167½
10 "	225
12 "	270

Weights of Cast Iron Soil Waste or Vent Pipes

	Lbs.
2-inch inside diameter	20
3-inch " "	30
4-inch " "	45
5-inch " "	85
6-inch " "	100
7-inch " "	135
8-inch " "	167½
10-inch " "	225
12-inch " "	270

Ferrules

34. Brass ferrules shall be of the best quality, bell-shaped, heavy cast brass, not less than four and one-half inches long and two and one-quarter inches, three and one-quarter inches and four and one-quarter inches in diameter, and of not less than the following weights:

Inside Diameters.	Weights.
2¼ inches	1 pound 8 ounces
3¼ inches	1 pound 12 ounces
4¼ inches	2 pounds 8 ounces

1¼-inch ferrules shall not be used.

Soldering Nipples

35. Soldering nipples shall be of heavy cast brass or of brass pipe, iron pipe size. If cast, they should be of not less than the following weights:

Diameters.	Weights.
1½ inches	8 ounces
2 inches	14 ounces
2½ inches	1 pound 6 ounces
3 inches	2 pounds
4 inches	3 pounds 8 ounces

Wrought Iron Pipe

36. Galvanized wrought iron pipe shall be of not less than the following thickness and weight per lineal foot:

Diameters.	Thicknesses.	Weights per lineal foot.
1¼ ins.	.13 in.	2.25 pounds
1½ ins.	.14 in.	2.68 pounds
2 ins.	.15 in.	3.61 pounds
2½ ins.	.20 in.	5.74 pounds
3 ins.	.21 in.	7.54 pounds
3½ ins.	.22 in.	9.00 pounds
4 ins.	.23 in.	10.66 pounds
4½ ins.	.24 in.	12.34 pounds
5 ins.	.25 in.	14.50 pounds
6 ins.	.28 in.	18.76 pounds
7 ins.	.30 in.	23.27 pounds
8 ins.	.32 in.	28.18 pounds
9 ins.	.34 in.	33.70 pounds
10 ins.	.36 in.	40.06 pounds
11 ins.	.37 in.	45.02 pounds
12 ins.	.37 in.	48.98 pounds

Lead Pipe

37. Lead pipe used for branch soil waste, vent or flush pipes shall not weigh less than the following specified weights per lineal yard:

Dia. of pipe.	Weight per lineal yard.
1¼ inches	7 pounds
1½ inches	8 pounds
2 inches	10½ pounds
2½ inches	13½ pounds
3 inches	16½ pounds

4 inches .....24 pounds
(Equivalent to sheet lead weight 8 pounds per square foot.)

38. Lead bends and lead traps for water-closets, slop sinks and urinals shall not be less than one-eighth of an inch in thickness (equivalent to sheet lead weight 8 pounds per sq. foot). All lead traps, bends and fittings shall correspond in weight and quality to the lead waste pipe to which they are attached.

Brass Pipe

39. Brass pipe for soil waste or vent pipes shall be thoroughly annealed, seamless drawn or brazed tubing, having not less than the following specified outside diameter, weight and gauge:

Outside dia. of pipe.	Weight per lineal foot.	Br. Imp. wire gauge.
1¼ inches.....	0.88 lbs.	16.
1½ inches.....	1.06 lbs.	16.
2 inches.....	1.54 lbs.	16.
2½ inches.....	2.82 lbs.	12.
3 inches.....	3.41 lbs.	12.
4 inches.....	5.74 lbs.	10.

House Connections With Public Sewers

40. House connections with the public sewer, and all fittings and other material used for such connections shall be inspected by the Local Board of Health or authorized inspectors.

41. The size of house connections shall be determined by the total area of the lot or lots to be drained, according to the following table, provided, however, that should the number of fixtures to be installed require a sewer larger than indicated for the lot area, the size of the house sewer shall be increased accordingly.

Table of Vitrified Tile Pipe for House Connection Size

Area of Lot or Roof to be Drained	Size of House Connection.
1 to 2500 Square Feet	4 inch
2501 to 7500 Square Feet	6 inch
7501 to 18000 Square Feet	9 inch
18001 to 45000 Square Feet	12 inch

Note.—For cast iron drains use one inch smaller in diameter, but in no case shall less than four inch diameter be used.

42. Old house connections can be used in connection with the new building or new plumbing only when they are found, on examination by the plumbing inspector, to conform in all respects to the requirements governing new house connections.

43. When a proper foundation consisting of a natural bed of earth, rock, etc., can be obtained, the house connection may be of earthenware pipe. Where the ground is made or filled in, or where the pipes are less than three feet deep or in any case where there is danger of settlement by frost or from any cause, and when septic tanks are used, the house connection must be of cast iron pipe, with lead caulked joints.

44. No house connection shall be laid with a less fall than one-quarter inch per foot. A uniform grade shall be preserved between the connection with the public sewer and the curb line and between the curb line and the building line. The house connection must be run as direct as possible. All changes in direction must be made with proper fittings and all connections made with Y-branches and Y-branches and one-eighth bends.

45. No person shall connect or cause to be connected, the drainage system of any building, lot, premises or establishment, otherwise than with that portion of the public sewer system intended for it, as shown by the records in the office of the engineer.

46. No person shall cut or tap or cause to be cut or tapped, any public sewer in which there exists a branch or junction opposite to the building, lot, premises or establishment, to be connected and within two (2) feet, on the down side, of the trench on proposed connection. Information concerning the location and depth of public sewers, and the position of branches and junctions, shall be furnished when requested, by the engineer. All reasonable care shall be taken to insure the correctness of such information, but such correctness will not be in any case guaranteed by the Local Board of Health.

47. Whenever it has been positively ascertained that no availably located branch, junction or suitable inlet exists to serve the property concerned, the connection shall be made by taking out a length of pipe and substituting therefor a branch of the proper size.

48. If the house connection be of iron, not more than four inches in diameter, and the public sewer eight (8) inches or more in diameter, the connection may be made by tapping a hole of the least practicable size in the public sewer, and the connection shall be made by means of a connecting thimble of approved pattern. The tap and connection shall be inspected before the same is cemented; the thimble shall be properly set as to direction of flow.

49. All connections shall be certified in writing by the inspector making the inspections on same.

50. If the public sewer be a brick or concrete sewer, or a connection is to be made in a manhole, the entrance hole into the same shall be cut in prescribed manner, and the connection made by means of a short piece of pipe of the prescribed diameter, so cut that the pipe shoulder shall rest against the outer surface of the sewer and no portion extend within it.

MUST BE INSPECTED

Municipal councils are required by the proposed regulations to appoint Inspectors of Plumbing for their respective municipalities.

This is a long step forward, not only for the trade, but for the protection of the public as well.

A very important feature under the proposed regulations will be the passing of examinations by all those who undertake plumbing work. This will not mean that the number of legitimate plumbers is in any way restricted.

51. Every house connection shall be laid true to line and grade, each section of the pipe being properly bedded. If laid with iron pipe the joints must be caulked; if laid with vitrified clay pipe, the joints must be made with mortar, composed of one part Portland cement or equivalent and two and one-half parts clean sand, the pipes shall be laid upon a firm foundation and the joints properly cleaned on the inside.

52. No person shall make or cause to be made or maintained, any connection with any public sewer or house drain, or appurtenance thereof, for the purpose of conveying into the same any suffocating, corrosive, inflammable, or explosive liquid, gas, vapor, substance, or deleterious material of any kind; and no person shall do any act or thing which may impede or obstruct the flow, or interfere with the free discharge or ventilation of any house drain or appurtenance thereof.

House Drain and Main Vent Pipe

53. The house drain, unless otherwise provided, shall be of cast iron and shall be not less than four (4) inches in diameter, and the fall to the sewer shall be on an even grade of not less than *one-quarter of an inch per foot throughout its entire length.* It shall be laid in a trench cut to a uniform grade, or if above the surface, it may be supported on brick piers or suspended from the floor beams by heavy iron or steel hangers. It shall commence at a point not less than eight (8) feet outside the external wall of the premises and be extended undiminished in size inside the building, and continued on as a vertical soil pipe and main vent pipe through the roof, and not less than three feet above the top of any window or opening within fifteen feet, and not less than eight feet above the roof if the roof is used for drying clothes or as a roof garden, and be left open so that the whole of the plumbing system may be thoroughly and constantly ventilated.

54. The house drain shall not be exposed to pressure where it passes through the wall.

55. The junctions of all soil or waste pipes with the roof of any building shall be made water-tight and weather-proof with a five-pound sheet lead flashing not less than 20 inches square.

56. To protect against freezing all vent pipes shall be increased to 3 inches in diameter before passing through the roof of the building.

Main House Trap

57. Whenever a main house trap is by municipal by-law required, the said main trap shall be inserted in the house drain; such trap shall be of a form approved by the Local Board of Health and shall correspond in weight and quality to the other portions of the house drain, and shall be provided with a suitable hand-hole for convenience in cleaning.

Fresh Air Inlet

58. Whenever a main trap is by municipal by-law required, then also a fresh air inlet shall connect with the house drain immediately inside of the main house trap. It shall consist of a pipe not less than four inches (4″) in diameter and shall be extended, outside the external wall of the premises, at least eighteen inches (18″) above the ground, and shall, where practicable, be placed not less than ten feet (10′) distant from any window, door or other opening in the premises, and shall be finished off with a return bend or cap. In no case shall a fresh air inlet be connected directly over the house trap.

Cleanouts and Cleaning Out Screws

59. A cleaning out screw shall be placed on the house drain as close as possible to the point where it leaves the building and on the inside of the foundation wall, and shall be formed by placing a full "Y" on the drain and extended to or above the floor and so placed as to be readily accessible.

60. Cleaning out screw shall be provided at the foot of all vertical lines of soil and waste pipes and at all changes in direction—distance between cleanouts should not exceed fifty feet (50′).

61. The cleaning out screw on house traps, drains and stacks shall be of the same diameter as the pipes to which they are attached, except where the drains or stacks are more than four inches in diameter, in which case the cleaning out screw shall not be less than four inches. (4″).

62. Cleanouts fitted for cast iron shall be properly jointed into a hub. In no case shall they be fitted into a plain piece of pipe.

All cleanouts shall be of an approved pattern, the covers of which shall be made of brass (except Barrett cleanouts), at least 3-16 inches in thickness, the covers of which shall have a solid cast square head of 1½ inches and one inch in height; they shall be screwed and made airtight by the use of a suitable gasket. Barrett or Malcolm fitting covers may be made of cast iron held in place by brass bolts and brass nuts and made airtight by means of a rubber gasket.

The remainder of the proposed plumbing regulations together with the proposed new regulations in connection with gas-fitting will be printed in the next issue of SANITARY ENGINEER.

A New Series for the New Year

SANITARY ENGINEER has arranged for a series of practical articles for the coming year on the very important subject of heating and ventilating. These will be written by N. A. Kearns.

It is not planned to go over the ground that has been covered in the articles which have appeared in SANITARY ENGINEER during the past few months but to go into the matter from the standpoint of a detailed analysis.

The question is such a broad one and there are so many details in connection with it, all of vital importance to the man in the trade, that it is suggested that these articles be kept for reference as they will contain a wealth of valuable information.

Alphabetically Arranged

The matters to be discussed will be arranged alphabetically so that they may be readily referred to at any time.

A partial list of the subjects which will be gone into includes Absolute Temperature, Air, Anemometers, Accelerated Systems, Asbestos, Boilers, Belts, Cast Iron, Combination Systems, Combustion, Dimensions (standards), Fans, Fluids (Laws Governing), Formulae, Furnaces, Fuels, Galvanized Iron, Generators, Grates, Gravity Systems, Humidity, Hydrostatics, Joints, Materials, Mixing Dampers, Molecular Theory, Mud, Packing, Pipe Pressure, Radiators, Registers, Regulators, Rules, Steel, Statics, Traps, Tables, Tanks, Tests, Thermometers, Thermostats, Valves, Vapor Systems, Ventilation, Vacuum Systems, Water, Zero.

The list is by no means complete; but should be sufficient to indicate how varied are the subjects to be covered in this series.

At times a number of subjects will appear in a single issue of the SANITARY ENGINEER. At other times only one detail may be presented, because of the necessary length of the descriptive article.

Illustrations

The entire series will be illustrated with drawings, or photographs, where such are necessary to clearly convey to the reader the meaning of the text.

Specifications

Under the letter "S," specifications will be analyzed in detail. Clause by clause, different specifications will be examined and we shall point out why certain fittings are used in good work.

Forced Hot Water Systems

These systems are returning to popular favor; so we shall deal at some length with the principles governing, and the details used in, this class of heating work.

Tables

Tables will be given under the letter "T," and references will be made to these tables when subjects requiring tables appear under another heading.

Electrical Notes

There are certain terms used in electrical work that the ventilating engineer should be familiar with. The meanings of the terms will be given, together with such other information as may ordinarily be required by the practicing engineer.

All Subjects to be Treated Fully

Beginning with the letter "A" we shall go through the alphabet, touching on, and treating fully, every item from "Absolute Temperatures" to "Zero." From time to time we shall furnish an index indicating the dated appearance of certain letters; so that our readers may find at any time articles in which they are interested.

The Convenience of the Classification

Just at the time of its presentation, a paper may not contain the data that are of immediate value to the reader but he may find some time later the required information regarding, say, Anemometers; so he looks under "A" and finds the information desired. Or again, it may be "Indirect Radiators" that he is interested in. He looks under "I" and finds that note is made of this subject under the heading of "Radiators" as listed in the "R's."

Cheap Water May Be An Expensive Luxury

In Montreal, the daily quantity of water consumed weighs 12 times as much as the entire population of the city. In other words, every individual may be said to consume 12 times his own weight of water. In Toronto, the weight of water consumed is 10 times that of its population; in Hamilton, 13 times; in Ottawa, 17 times; in Quebec, 15 times; in Halifax, 17 times; in St. John, 21 times.

As a contrast with the above figures, the daily weight of water used in Winnipeg is less than 5 times that of its population; in Brandon, 7 times; in Regina, 4 times; in Saskatoon, 6 times, and in Moose Jaw, nearly 5 times.

One of the commonest causes of overconsumption is the policy adopted by our Eastern cities of supplying water on the flat rate, with absolutely no control of the individual consumption or waste. In the Prairie Provinces, on the other hand, we find a much lower consumption, which, of course is due to the fact that, in that section, the charges are usually made on the meter basis.

Constant Circulation is Aim of Ventilation

The aim of any ventilation system should be to achieve a constant circulation of air, without causing a direct cold draught. There must be an entrance for fresh air from outside and a means of egress for the foul air. Circulation is readily accomplished by the difference in temperature between the inside and the outside air. The greater this difference, the stronger is the current, so that a very small aperture in winter may secure as much ventilation as a wide-open window in summer.

In English houses, with their open fire grates, the chimney serves as an excellent channel for the removal of foul air. In Canada, where we have a furnace in the cellar and cook by gas, we have, while immensely improving the efficiency of our heating systems, not generally provided any means by which ventilation is combined therewith. Every furnace ought to have a pipe connecting with the outside air, which would bring in fresh air and warm it for distribution through the house.

Unfortunately, we must, in the majority of existing houses, fall back on the windows to let in clean air. Although they are, at best, unsatisfactory, they can very often be improved. To begin with, the type of double window which has no aperture except three little holes or a slit, invariably choked with snow and ice, should be discarded. A sliding or hinged pane should always be provided. Then, if the upper inside window be opened, the air must circulate between the two windows before entering the room and thus a direct draught is avoided, while the volume of new air is readily regulated to suit the coldness of the day and the strength and direction of the wind.

The "Post," of Yorkshire, England, states that a change in the method of charging for gas is now proposed, according to a statement by Sir Auckland Geddes. The suggestion is that, instead of buying gas by the cubic foot, the consumer should buy it on the basis of the heat it is capable of developing, as for nearly all uses to which gas is now applied its heating value is the desideratum.

EDITORIAL COMMENT

THE NEW REGULATIONS

SANITARY ENGINEER is the first publication to present to the men in the trade in Canada the much-talked-of and long-discussed proposed new plumbing regulations for the Province of Ontario. The regulations in themselves are most important and while they have not yet been put into effect will, it is stated, become law very shortly. It is likely that they will be used as a basis upon which every other Province in the Dominion may revise its own by-laws.

From information available from various sources there is little doubt that the by-laws in many sections of Canada will stand considerable improving. Not always, in fact very seldom, do those holding legislative offices, appreciate the vital importance of the public health. Very often these matters are left to boards composed of men who know little or nothing about the important matters entrusted to their care. Very frequently there is legislation, such as it is and there is no one to enforce it.

One of the best things about the proposed new Ontario regulations is that they are based absolutely on "good practice." This is not one man's views on good practice, but the views of many, and also of men from different parts of the province who have had to meet conditions that any individual might never encounter.

Another good thing about them is that the regulations put the case squarely up to the men in the trade. It is up to them to do good work and if they live up to the requirements of the law they need fear no investigation. There has in the past been a good deal of complaint upon the part of the public. The new regulations will satisfy the public also. If any citizen, anywhere in the province, is dissatisfied with any work done, he can call in a competent inspector and if the work is not right it will be made right.

Standardization of pipes and of weights of fittings, etc., is another important matter that has been worked out. Most of the men in the trade are agreed that this is a step in the right direction. It may also have very important effects in eliminating to a large extent that great evil in the trade, price cutting.

BRISK BUILDING SEASON AHEAD

WITH the most active building year since 1914 drawing to a close, there is every indication that next season will see all records for construction smashed in Canada. This, too, in spite of the highest prices on record for many commodities essential in building. The scarcity of homes all over the country remains acute and it is not exaggerating at all to say that thousands of people are living either doubled up with others, or in places where they intend to remain only until they can get better accommodation. Another factor in the situation is that in the larger cities especially, thousands of those who do not own their homes have been the victims of landlords who have proven absolutely heartless. These "gougers," as they have been rather appropriately termed, have been demanding and getting rentals that are out of all proportion to the value they are giving. They have taken advantage of the man who has to rent and who cannot help himself. The result in a great many cases is that the renter is planning to become an owner even though he realizes that it is going to cost him something to build his own home. Another condition that seems general all over Canada is the real scarcity of small dwellings suitable for the requirements of working men. Heads of factories in many places have been taking this matter up with councils and others, urging that something be done in order that they may enlarge their staff of workmen to take care of steadily growing business. All this of course means opportunity for the sanitary engineer. It means chances for him to sell not only the materials used in building but the many articles used in equipping the home for occupancy. In the previous issue of SANITARY ENGINEER a manufacturer gave it as his opinion that as far as the future was concerned, it was going to be, from the merchant's standpoint, not a question of price, but of getting the goods to sell. Sanitary engineers, more perhaps than any other men in the trade, have known just what this means for the past five years and many of them are sizing up the outlook and laying their plans accordingly.

PROMPT ACTION IS NEEDED

THE *Financial Post* makes timely comment in regard to the important question of "Should the Government Keep the Railroads?" This is a matter which is of particular interest to business men all over the country. The *Financial Post* says:

"That the return of all the railroads in Canada to private ownership is the solution of the national transportation problem has been argued by W. F. Tye, one of the leading authorities on the railway situation in Canada, before the McGill Canadian Club at Montreal. The people of the United States had learned a lesson from Government operation and were longing for the time when the roads would be given back to their owners, he said, and pointed out that the only successful Government railways had been in Germany where conclusions could not be drawn because the systems were part of the military machine and both cost of operation and revenue charges could be regulated to suit the conditions prevailing.

"That the Government should regard the railroad problem as one which may be solved without the permanent adoption of public ownership on a broad scale will appeal to most people with a practical knowledge of the question. Even accepting the Government's argument—which we do not—that there was no other way out of the crisis than to take over the various roads, it does not necessarily follow that it is in the interests of the people of Canada that the Government should go into the transportation business on a big scale permanently.

"As we see it, the business of the Government is not to run railroads simply because it made loans on railroad security which were defaulted, any more than it would be the business of a bank to do so under similar circumstances. The bank would, perhaps, take over the property temporarily, and handle it in a manner to realize the largest possible sum when conditions favored a sale. This is the course which the Government might very well consider—to maintain the properties in the most efficient conditions possible, to improve that condition if feasible even to the extent of further investments, and then dispose of them when this can be done to advantage.

"The Government has made its mistakes in its policy of making advances and undertaking guarantees for railroad construction. These mistakes involve financial losses. It would be better to face these losses at once than to attempt a policy which will cover them for the time being, but lead to still greater losses in the future. It is a wise business man and a wise Government that knows when it is good policy to face one loss and thus prevent other losses."

RED BLOOD NEEDED

NOMINATION day is almost at hand, when a selection will be made of the men who are to direct the affairs of municipalities, large and small, all over the Dominion. There never was a time in the history of this country when red-blooded men were so badly needed as right now. Real problems exist which, if not solved wisely, will affect conditions for many years. Such matters as the housing shortage, the fuel problem, the settlement of labor difficulties and similar important questions are general. Experience has proven that businesslike handling of big problems is only possible when business men take hold of them. One of the most regrettable things in connection with municipal and public matters generally in the past has been that so few business men, comparatively speaking, are to be found taking an active part. This has resulted in many situations arising that would not have been possible had men with business training been at the head of things. Men who are used to settling matters quickly and efficiently every day are invaluable at any council board. They are needed always, and especially just now. It was the business men who led the fight against the extremists in Winnipeg last summer and quickly and effectually stamped out Bolshevism as soon as it raised its head. The results of last week's elections in Winnipeg may be attributed to the good work of the business men. They aroused the right-thinking people of the community to the real dangers that exist if the extremists gain control of civic matters. Fortunately for the country at large there are very few such problems to be solved as that in Winnipeg. But there are any number of others which the business men can and should lend a hand in settling. Their experience is needed and their counsel has a value that is far beyond a mere dollars and cents basis. If you are asked to be a candidate, even though you are a very, very busy man, give the matter your most earnest consideration, and if possible accept. Remember that with more business men at the head of affairs there will be less cause for future trouble.

THE Editors of SANITARY ENGINEER extend to sanitary and heating engineers, throughout the Dominion, heartiest wishes for a very Merry Christmas and a bright and prosperous New Year.

WITH SO MUCH loafing going on the term "social unrest" seems to be a bit misleading.

* * *

THE kinds of goods that keep moving are the kinds the public like and are the kinds that bring the profits. No merchant ever made any money out of shelf warmers.

News from Here and There

CONTRIBUTIONS OF NEWS GLADLY ACCEPTED

New Firms

Petitgrew & Lamontagne, plumbers, have been registered at Quebec.

Pierre Therrien & Co., plumbers, have been registered at Montreal.

Joseph Rousseau & Co., tinshop and plumbing, has been registered at Montreal.

Trade Notes

Cairo Sanitary Baths has been registered at Montreal.

The Canadian Aladdin Company, manufacturers of standardized houses, will erect a $70,000 factory at Peterboro shortly.

D. A. Blair, plumber, Toronto, is discontinuing business.

Personals

E. Louis LeGrow is an aldermanic candidate for Ward Four in the Toronto civic elections.

President Thomas Fergusson, of the Toronto Society of Domestic Sanitary and Heating Engineers, who, as stated in a previous issue of SANITARY ENGINEER, was ill with pleurisy, is at work again. His wife, who was also taken ill with the same disease, has made a good recovery.

Obituary

The death occurred at Quebec City of L. H. Gaudry, president of L. H. Gaudry & Co., Ltd., importers of pipe and waterworks supplies. He was also president of the Eastern Canada Steel and Iron Works, Ltd.

The sympathy of many friends will be extended to Mr. and Mrs. James Griffin, of 80 St. Matthew street, Montreal, in the loss of their sixth son, Bernard Stewart, which occurred at the home of his parents on December 11.

"Bernard" had been in good health until a week previous to his death, in fact he had attended school on Friday, December 5. Contracting a cold, it developed into pneumonia, and the end came within the week.

Following a stroke, the death occurred at her home on Tuesday of Mrs. Sarah A. Cooper, mother of George Cooper, plumber, 113 Church Street, Toronto. Mrs. Cooper was 85 years old.

IS NOT A CANDIDATE

James Richards, of the Plumbers' Union, nominated as the Labor candidate for alderman in Ward Four, Toronto, informed the Independent Labor Party at its meeting on Saturday that he must withdraw his name and would not take part in the campaign.

George Clapperton Is The New President

At the regular meeting of the Toronto Society of Domestic Sanitary and Heating Engineers this week officers for the coming year were elected as follows:—

President—George Clapperton.
Vice-president—Roy E. Belyea.
Treasurer—Thos. M. Maxwell.
Secretary—Garrett F. Frankland.
Warden—W. H. Daw.
Tiler—Lyman Swanston.
Auditors—W. A. Lord, D. E. Norwich and Fred. A. Wiles.
Executive—Geo. R. Baker, H. A. Farthing, F. H. Gentle, T. F. Kelly, F. R. Maxwell, A. S. Purdy, H. G. Waterman, H. A. Weinraub and John Wright.

Sanitary Inspector Active at Peterborough

Peterboro, Ont.—C. L. Stapleton, sanitary inspector, is making very active endeavors to have his presence felt for the sanitary betterment of the city. At police court J. T. O'Connell was ordered to pay $3.10 costs on a charge laid by the sanitary inspector against him, to which he pleaded guilty. He was charged with an outhouse on property owned by him, 439 Park Street, without the permission of the Board of Health, contrary to the city by-law.

Abraham Lowe was called on to pay $3.10 cost for filling a cellar window of 217 Hunter Street with common manure. There is no glass in this window and the owner took this method of keeping out the frost. The sanitary inspector ordered the stuff to be removed, but as this was not done, court proceedings were adopted.

GUELPH COUNCIL TO LAY NEW CONDUITS

Guelph.—Acting on a mandate from the Provincial Board of Health, the city council has authorized the city engineer to proceed with the replacing of present conduit pipe which supplies Guelph with drinking water with a new water-tight pipe. The cost will be something over $100,000, and the work will be started at once. It is the purpose of the engineer to use wood stave pipe.

Tenders

Tenders will be called January 1 for heating and plumbing for new $50,000 laundry building to be erected at St. Thomas, Ont., for the Aylmer Laundry Co., of Aylmer, Ont.

Plans are being prepared for new sewage disposal system for the Deloro Smelting Co., of Deloro, Ontario.

The ratepayers of Forest, Ont., will vote on a by-law to provide for the installation of a new waterworks system on January 5.

Tenders will be called shortly for new school at Ingersoll, Ont., to cost $20,000 for Separate School Board, Father Gnam, chairman.

By-law for erection of new school to cost $150,000 has been passed at Brandon, Manitoba, and plans are being prepared.

Plans are to be prepared at once for new school to cost $50,000, for the Public School Board, Campbelltown, New Brunswick, E. M. Hogan, secretary.

Heating and plumbing tenders are wanted in connection with new $85,000 annex, being erected at Winnipeg, to university by Provincial Department of Public Works.

S. M. Brookfield, Ltd., Halifax, N.S., will let plumbing and heating in connection with new $35,000 bank for the Royal Bank of Canada.

Frid Construction Co. will award heating contract in connection with new $30,000 church at Hamilton, Ont., for St. Stephen's Anglican Church.

Tenders will be called shortly for new $80,000 bank at Ottawa for the Banque Nationale, St. Peter Street, Quebec.

J. & J. Allen, Allen Theatres, Toronto, will call for tenders shortly for new theatre to cost $100,000, at Windsor, Ont.

By-law was carried at Woodstock, Ont., by which the Brunswick Phonograph Co. will erect new factory to cost $200,000.

P. A. Belleperche, Huron & Erie Bldg., Windsor, Ont., wants prices on plumbing and heating for new $32,000 store and flat.

Plumbing tenders wanted by F. A. Nightingale, 168 North St., Halifax, for new flats costing $10,000.

Plumbing and heating to be let for four family duplex, costing $20,000, for W. J. L. Lewis, 485 Arlington St., Winnipeg, wants prices on plumbing and heating for new residence to cost $7500.

Ward Bros., 242 Dougall Ave., Windsor, Ont., will award plumbing and heating in connection with six new residences, costing $16,000.

Plumbing and heating to be let for new residences, costing $20,000, for R. J. Poyntz, 362 Runnymede Road, Toronto.

Dr. E. M. Fulton, Sherman St. South, Hamilton, Ont., wants plumbing and heating prices for new residence and office, costing $8,000.

Hugh G. Fraser, 5 Blowers St. Halifax, N.S., wants prices on plumbing and heating for new residence costing $9,000.

Contracts Awarded

Contracts in connection with alterations to northeast wing of the King Edward Hotel, Toronto, costing $40,000, and including installation of 18 new bathrooms, have been let as follows: plumbing and heating, W. J. McGuire, Limited, 91 Jarvis St., Toronto; fixtures, Imperial Products Co., 79 Adelaide Street, Toronto.

Charles E. Hamelin, 3 Olivier St., Three Rivers, Quebec, has plumbing contract for new presbytery costing $25,000 for the Catholic Congregation at Cap de la Madeleine, Quebec.

Silvester Bros., Stouffville, Ont., have contract at $1,500 for new bathroom equipment and hot water heating at home of Dr. Freel.

Battler & Freiburger, Kitchener, Ont., have heating and plumbing work for new $30,000 nurses' home being erected by Hospital Board.

Thomas O'Connell has plumbing contract for new $135,000 church and presbytery being built at Montreal for the parish of St. Augustin.

Germaine & Freres, Three Rivers, Quebec., have plumbing contract for $200,000 school being erected for the Commissioners.

A. Matthews, Limited, Toronto, have plumbing and heating contract at $2,565 for stables and office building being erected for the Board of Control.

Thomas O'Connell, Montreal, has heating and plumbing contract at $16,800 for new $100,000 school being erected at Verdun for the Protestant School Commission.

A. Rodgers & Co., Hamilton, Ont., have plumbing and heating contract for new $100,000 factory being erected for Wagstaff's, Limited.

W. J. McGuire, Ltd., Toronto, have contract for heating for new $250,000 factory at Kitchener, Ont., for Ames-Holden, McCready, Ltd., Montreal.

O. Caron, Maissoneuve, has plumbing and heating contract for new $34,000 warehouse for Bournival & Co., Montreal.

F. P. Giguere, Ltd., Quebec City, have plumbing and heating contract for new $50,000 shoe factory being built for the Gosselin Shoe Co.

Bennet & Wright have plumbing contract for new $100,000 store and office building being built at Toronto for the Wm. Davies' Co.

W. T. Borland has contract for plumbing and heating for four residences, costing $24,000, being erected at Montreal for James Angus, 314 Beaver Hall Hill.

Ontario Executive to Continue Aggressive Campaign During the Coming Year

Excellent Results Are Being Obtained From Work Being Done in Various Parts of the Province by Directors—Co-operation and Support of Every Man in the Trade is Needed

THE Executive of the Ontario Society of Domestic, Sanitary and Heating Engineers are planning a "drive" into Eastern Ontario in connection with the aggressive campaign of organization work which they have been carrying out.

Early in the new year it is expected that a trip will be made to Peterborough to discuss with the master plumbers of that city matters of importance in connection with the work that is being carried on.

Have Had Busy Season

While the directors have had a busy season and have accomplished much as a result of their efforts, they are planning still greater activity for 1920. It is realized that the time to get results is now, and the executive officers plan to follow up the work they have undertaken with still greater efforts next year.

The work that has so far been accomplished is only an incentive to greater things, as it has shown the splendid possibilities ahead. If every man in the trade will lend his co-operation and support to work that is in the interests of all, real results will be obtained. These will not only affect every individual sanitary and heating engineer, but will also make for general betterment of the trade as a body.

Practical Work

Co-operation and education will accomplish wonders, and one of the results of the campaign that has been carried on in various parts of the province for the past few months has been to show the master plumbers the absolute necessity of working together, if they are ever to accomplish anything.

Another very important matter has been to bring them to a realization of the necessity of conducting business on business principles if they are going to stay in business and meet conditions as they exist to-day. Many of the men in the trade, as a result of what they have learned, have stopped leaks that were eating into profits. Not only this, they have learned how to figure on a proper basis and obtain the profits on their work to which they are entitled.

Many Meetings Held

During the season meetings have been held at Hamilton, Brantford, Windsor, Chatham, Galt, Preston, Kitchener, and Welland. These are only the forerunner of many meetings that are planned.

Fined $200 For Failure to Keep Proper Books of Account

Conviction Secured by Canadian Credit Men's Association in Charge Laid Against Merchant at Sault Ste. Marie

AS stated in a previous issue of SANITARY ENGINEER, in connection with a charge of perjury with intent to defraud creditors, laid under the Ontario Bulk Sales Act, against L. W. Putnam, by the Canadian Credit Men's Association, Putnam was found guilty.

A conviction was secured and Putnam has been sentenced to a term of three months at the Jail Farm.

The Canadian Credit Men's Association is watching closely for cases of merchants who are inclined to be dishonest with their creditors and plan to prosecute.

Have Another Case

A few days ago they prosecuted in another case, that of S. Joseph of Sault Ste. Marie, Ont. Mr. Joseph, after having been in business at the Soo about nine months, made an assignment, and upon a statement being prepared, there was found to be a very large deficit. The case was followed up by the association, and while it was found impossible to secure direct evidence of fraud, they alleged that he had committed perjury in connection with his examination for discovery.

Failed to Keep Books

He was arrested on this charge, and was also charged with failure to keep proper books of account.

He was tried before a jury and acquitted on the perjury charge, but convicted on the other and sentenced to two months in jail, and in addition to pay a fine of $200 or to serve an additional two months in jail.

Taylor-Forbes Co. Insures Employees

The Taylor-Forbes Company, Limited, of Guelph, Ont., is putting into immediate effect a profit-sharing plan by insurance for its employees. A notice to the employees states:

That the Taylor-Forbes Company has insured the lives of all its employees according to the length of service with the company, beginning after the first three months with $500, and ending with $3,000 as the maximum amount, as shown in the list below.

Medical examinations are not required.

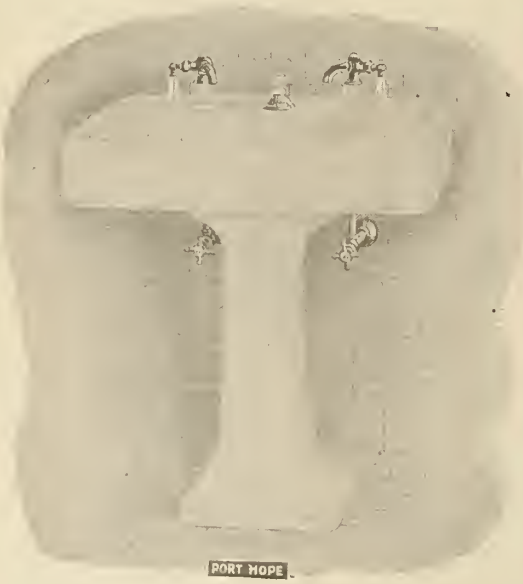
Any employees who were in the army will be allowed full time for such service as part of their working years. Every year of continual service with the company will add to the insurance policy value up to $3,000. It will not in any way interfere with any advance in wages or earning capacity. Employees in continuous service three months to one year will receive $500; one year to two years, $600; two to three years, $700; three to four years, $800; four to five years, $1,000; five to six years, $1,200; six to seven years, $1,300; seven to eight years, $1,400; eight to nine years, $1,500; nine to ten years, $1,000; ten years' service, $2,000. For each year after eleven years $100 per year will be added, until the sum of $3,000 is reached. When an employee has served nineteen years he receives a policy for $3,000. Employees who were in the service of the company on or before April 1, 1902, will receive a $3,000 policy.

REGISTERED TRADE MARK

SUPERIORITY PURITY DURABLE AS THE PYRAMIDS

Port Hope Sanitary Plumbing Ware

Every Fixture is unconditionally guaranteed and bears our label as a protection for you and your customers.



THE "CANTERBURY" LAVATORY

A MERRY XMAS

Toronto, Dec. 15th, 1919.

To the Trade—

Dear Sirs:—

On looking back, we recall the feeling of great uncertainty as we entered the year which is just drawing to a close.

All our worries and forebodings have been in vain and were unnecessary—the country in general is prosperous, the individual is prosperous and but for a certain natural post-war feeling of unrest, happiness has reigned supreme.

We can all do much during the coming year to dissipate the unrest cloud and to bring about a healthy national mental condition.

Let's get together.

To one and all a Happy New Year.

Port Hope Sanitary Mfg. Co., Limited

REGISTERED TRADE MARK

Bath Room—Plate "D"

From Page 7 "For the Home," Catalog

Plate F. 0220 —5½-foot Panel Bath with fittings.
F. 110 —22 x 33-inch "Leighton" Lavatory with fittings.
F. 91½—"Penzance" Foot Bath on Base, with fittings.
F. 603 —Closet Combination.
F. 7313 —18 x 28-inch White Enamel Frame Mirror.
F. 5207 —6 x 24-inch Opal Shelf with Rail.
F. 4045 —Soap Dish.
F. 2409 —24-inch Opal Towel Bar for Lavatory.
F. 3608 —36-inch Opal Towel Bar for Bath.
F. 1809 —18-inch Opal Towel Bar for Foot Bath.

Port Hope Sanitary Mfg. Company, Limited

Factory:
PORT HOPE, ONTARIO
TORONTO SHOW ROOMS
119 King St. East

WINNIPEG OFFICE
405 Tribune Bldg.
HALIFAX OFFICE: McCurdy Building, Hollis Street

Head Office:
ROYAL BANK BUILDING, TORONTO
MONTREAL SHOWROOMS
234 Beaver Hall Hill

What Will Happen When Prices Decline?

Indications That the Peak Has Been Reached in Many Lines—Suggestion That Prices Should be Guaranteed to Protect Retailer From Loss

WHAT'S going to happen when the prices drop? This question has been made the title of a most interesting article on the present price situation as applied to the manufacturer, the wholesaler and the retailer—as well as the consumer—by G. A. Nichols in "Printer's Ink." In answering, Mr. Nichols presupposes that the peak of the high price movement has been reached and that it is only a matter of time until readjustment is commenced.

Is Problematical

Whether that readjustment will be sudden or protracted he regards as problematical, but investigations indicate that people are developing a disposition to save money where possible and are looking for more moderate-priced goods or postponing purchases in the hope of lower prices to come. Mr. Nichols' inquiries have provided him with a composite picture of the whole situation and the conclusion is reached: That there is a noteworthy agitation on for lower retail prices and that it is spreading far outside its original limit of things to eat. Up to the present, however, the only specific direction in which it is being felt is the hesitancy on the part of dealers to place advance orders for ready-to-wear, including work clothing.

Shortage of Goods

From inquiries in the Canadian markets there appears to be as yet little indication that the time for a decline in prices is at hand. There is a marked shortage of goods in almost every direction, and there seems to be little chance of anything like a slump while this condition continues. That the effort of rising prices will eventually be to check buying is inevitable, but as the advance is a result of the shortage and it will be a matter of increased production to make up this shortage—and production is increasing very slowly, if at all—it would seem logical to anticipate that any readjustment will be gradual and spread over a considerable period.

Meeting the Situation

Manufacturers, wholesalers and retailers are all affected by this question of price adjustment. The actual losses to be faced in relation to goods on hand are in themselves a problem, but a still larger question is the placing of orders. In short, it is not so much a question of taking a loss on stock actually in hand, but of the uncertainty as to what the market may be three or six months hence for goods and materials which may be ordered to-day. Under such circumstances the safer course to pursue would be to work on a hand-to-mouth basis in making purchases, but this is a doubtful if not actually impossible policy when there is a prospect on the other hand that there will be an actual shortage of goods.

Guaranteeing Prices

One question which has been raised under the conditions prevailing has to do with the advisability of manufacturers guaranteeing prices for the protection of their customers. This is the policy which will be followed by a big concern manufacturing men's furnishing goods; the general manager says:

"We are going to meet this situation by guaranteeing prices, There is no use in temporizing with a proposition like this. I don't blame the retailers for being conservative. We are telling our customers that they need not hesitate or hold back. They can safely place their advance orders at present prices. Then if the market drops between now and the time for delivery of the goods, they will be billed at whatever the price is. There is nothing particularly new about this policy of ours. We used it to good advantage during the slow buying days brought about by the wartime merchandise crisis.

Likely to be Gradual

"Of course, in making this proposition to our customers we do so on the supposition that any decrease in prices that may come will be gradual. If the totally unexpected should happen and prices should drop all in a heap, I don't know just what would be the outcome. I do not think it would be any fairer for us to bear all the loss in this case than it would be to ask the retailer to bear it. But to think about this possibility is merely to borrow trouble. There isn't the slightest chance in the world for prices to slump over night. They will go down so gradually that the reduction can be absorbed without any distress. People manufacturing and selling goods may not make so much money, but I am sure they need not fear disastrous consequences.

Remove Timidity

"If manufacturers and jobbers generally were to guarantee their prices as we are doing this would remove much of the timidity retailers now are displaying. Most of the jobbers and manufacturers are insistent that the price decline will be gradual and that nobody need fear. All right then—let them have the courage of their convictions and guarantee their prices on advance purchases. We have no fear at all as to the consequences to us. And we are very sure that our customers will get a fair deal. I suppose that we are the most stiff-necked people in the country when it comes to cancellations. We want our customers to know their needs intimately enough to order merchandise that they really want. When we accept an order we expect to fill it. We have to manufacture or buy the goods to fill that order and we have a right to expect the retailer to make good on it. I suppose our cancellations owing to this policy do not amount to more than five per cent. But if a retailer should get up against it owing to price drops or any other reason, what is there to do other than to meet him at least on a fifty-fifty basis? Guarantee prices now so as to speed up the buying for future delivery and then later proceed with the dealer on a live and let live basis. This is our policy and we have no misgiving as to what may happen."

Careful Consideration

This question of guaranteeing prices to the trade is one which should not be adopted without careful consideration. In some lines of manufacture it may be successfully worked out and may justify itself by maintaining the demand of the retailer. In other cases it will be found to only have the effect of postponing the necessary adjustment. Much would depend also upon the position of the producer in relation to his raw materials. If he does not have to book ahead for his own supplies on a definite basis and has confidence in his ability to judge what is going to happen he may find it good business to take such a course, but if he has to make definite purchases at top levels in order to protect his own supplies it would seem to be going far to endeavor to protect the trade against loss.

Would Be Absorbed

There would appear much to support the contention of many experienced merchandisers that just as there were benefits all along the line on rising prices, so there will be losses to be borne on stocks on hand on any readjustment to lower levels, but in a gradual change such as is anticipated these should be absorbed without serious consequences. Advances on goods and materials in stock were justified on the ground that there would probably be a time of declining values, but no one looks to see such declines attain anything like the proportions of the advances. There should be no apprehension as to the various branches of trade and industry generally being able to meet the situation out of the profits of several prosperous years without being crippled.

CANADA'S GIFT APPRECIATED

Ottawa.—An interesting communication has been received by the Department of Agriculture from Belgium relative to the funds contributed in Canada to the British Empire Agricultural Relief Fund for the purchase of garden sets and small tools for farmers in the war-devastated areas of Europe.

The director of the Relief Fund in Belgium states that the total number of tools distributed totalled several thousand, and that many letters of thanks were received from the municipalities that benefited from the distribution. As a means of showing the gratitude of the Belgian people for the contributions occasion was taken at a livestock show to make a display of the tools distributed.

Over the display was a conspicuous sign indicating that the tools were the gift of Canada.

J. R. Myers & Sons, of Stratford, Ont., have been awarded contract at $10,000 for installation of new heating equipment in factory of the Canadian Edison Appliance Co.

Montreal Plumbers Look for Brisk 1920

Elect Officers to Man the Ship for Next Year—President Sees Plenty of Good Business—Unanimity of Spirit Prevails

THE annual meeting for the election of officers of the Montreal Master Plumbers' Association was a very successful one, and great unanimity of feeling prevailed. This is saying much, for when it is remembered that the personnel of the association is of a dual nature, both English and French elements uniting in the various work of the association, it can be understood that, to get upon a common basis of understanding, requires patience and charity.

It is, therefore, to the credit of the office-bearers who have guided the important business of the Masters' Association during 1919, that the year just closing has been one of, if not the most progressive and successful in history.

CAPT. D. A. BETHUNE
President Elect of the Montreal Association of Master Plumbers.

In addition to this, a foundation has been laid, or rather securely cemented, which augurs well for many years to come. Past President T. Latourelle, and his associates, have worked well, and have worked hard to secure these results.

The President-Elect Speaks

In an interview with Captain D. A. Bethune, the new president-elect, SANITARY ENGINEER ascertained that the outlook for 1920 is of a very encouraging nature, and that association matters bid fair to work out well.

"I believe that there are seven-eighths of the best master plumbers in the city now members of the Montreal association," said Captain Bethune. "We should have a good season in 1920. The architects' offices have many plans to be figured on; it just means that, labor and other conditions once settled, there will be plenty of work."

The Wage Problem

One of the trying circumstances of the past summer and fall season has been that of misunderstandings regarding the recognition of union labor, and also regarding remuneration or wages. Throughout, the masters were ever willing to reason with the men and to meet them fairly, as far as SANITARY ENGINEER has been able to learn from many different sources. In some cases, it is understood, the men walked out without assigning any reason therefor, and later they returned to the shops. All of this delay—this absence from the shop, made none of the men or the shops richer—it was evidently a time of inaction, and, while the uncertainty of getting material was a big factor in holding work up, the absence from work was a decided handicap to master and journeymen.

Expects Square Deal

The new president expects that, from this time forward, there will be a "square deal" policy as between the masters and the men. That does not mean that this is a new innovation, for the masters, and many of the journeymen, have been very fairly-minded toward one another. Not only so; some of the large shops had full, or nearly full, staffs during the workers' strike, which affected so many trades.

"To pay a man what he is worth," continued Captain Bethune, "is what we expect to get from at least a large section of the journeymen. With the carrying out of this policy there will be less trouble, and this section of the journeymen, at least, assure us that there will be no strikes."

Shops Are Willing

There has been, for a long while, a decided willingness upon the part of the leading shops to give the men good wages, and the best of treatment. SANITARY ENGINEER understands that good men are now drawing 75c per hour. That is a good wage, it would seem, under present living conditions, and it always must be borne in mind that the master has the unpleasant task of convincing the too often irate householder that a charge of $1.00 per hour is fair and just. At 75c cost to him, and having to pay his overhead expenses out of the charges made, the master, at $1 per hour, or at $1.25 per hour (depending upon the size of his staff and the work secured), is not going to make a fortune, in any case.

TELESPHORE LATOURELLE
Past President of the Montreal Association of Master Plumbers.

Have Had Difficulties

"In Quebec Province there has always been difficulty for the master plumber to hold his skilled men," continued the president-elect. "Wages here were lower for some years, and this meant that good men would not stay in Montreal very long, but would go, very often, farther West. The master had to face

Continued on page 28

Officers-Elect Montreal Master Plumbers' Association 1920

President, D. A. Bathune.

1st vice-president, H. Lavigeur.

2nd vice-president, J. P. Linton.

Chairman of hygiene committee, J. Brunet.

Chairman of arbitration committee, L. E. Moulton.

Chairman of legislation committee, A. Noel.

Chairman of apprenticeship committee, J. A. Gordon.

Chairman of price list committee, J. E. Walsh.

Audit committee, Messrs. Watson, Giroux, Daoust.

Trustees, Messrs. Delaney, Charette, Hardy.

Representatives to board of directors of Builders' Exchange, T. A. Latour.

Sees Record Business Coming in 1920

Manufacturer is Looking for the Greatest Volume of Trade in History of Canada Next Year—Sees Firm Prices for Merchandise Owing to Difficulty in Getting Raw Materials and the Men to Make the Goods

"IT looks like a bed of roses but as a matter of fact it is a mighty uncomfortable position to be in," was the way a leading manufacturer of enamelware of Toronto summed up the situation at the present time.

"Everybody thinks," he said, "because we have got so much business that we do not know what to do, that we ought to be perfectly satisfied. In one way, it is a good position to be in, but on the other hand we never had so much worry in our history.

Wants the Goods.

"Everybody is chasing us and chasing us hard for the merchandise and we simply cannot begin to get production. We are trying to keep them all satisfied by giving everybody as much as we can. Every day we get a pile of letters and in addition telegrams and long distance telephone messages wanting to know if this or that consignment has been shipped and if not when it will go forward. This is a continuous performance, and as you might imagine it gets rather tiresome. We are held up in getting our supplies of raw materials. We simply cannot get the help we want, either skilled or unskilled, and business keeps coming in from all parts of the country.

Record Year Ahead.

"There is every indication that 1920 is going to be a record year in the building trade. At the present time I can see nothing to prevent it. The only problem is going to be to get enough goods to keep up with the demands that are coming. We cannot take any credit to ourselves for selling goods these days. The demand is there and the business comes in so fast we cannot handle it. It is going to come, even faster next year, unless all signs fail. All over Canada there is a shortage of homes and there are many millions of dollars' worth of construction work that has been held over because of conditions.

Sees Steady Prices

"As far as I am able to judge, the markets are going to remain very firm. There are prospects that advances may be made as pig iron has been climbing steadily and the rate of exchange against Canada in the United States is getting to be a serious factor in the purchase of raw materials. Our pig iron in Toronto now will stand us about $45. That is a big advance and all these things have to be taken into consideration.

"There is the question of coal also. That is a very important matter. While we have plenty on hand for all immediate needs, there is a good deal of uncertainty about the future. We are, however, hoping for the best.

Business Very Active.

"Busines, in general, has been very active all over the Dominion. In the West, in our line, British Columbia is perhaps leading the other provinces. All over Ontario and the East, large amounts of work are under way and planned. The activities of the Housing Commisions will mean in itself a large volume of work next season, not to mention the work that will be undertaken by private and speculative builders.

"The present state of affairs, as I stated, is anything but a bed of roses. In addition to being unable to satisfy our customers, it means that our sales' staff is inclined to take things easy. They can say to us, 'Well, you cannot supply the busines if we get it, so what can we do.' Personally, I would rather have the business back on a normal basis, where it came in steadily and we were able to take care of everything. Under those conditions, every man of us was up on his toes, looking for all the business there was to be had, and we were not continually getting kicks from our patrons because of delayed shipments."

Appointed Sanitary Inspector.

Charles Dobbs, of Damascus, Ont., has been appointed sanitary inspector for the township of West Luther, to succeed Thomas Bishop, who recently resigned.

LOOK FOR BRISK 1920

Continued from page 27

this situation as best he could. Now we are more nearly, if not on the same basis as other centres and cities, and the men are getting good wages. Conditions are better, too. The plumber who has made any money is the one who has stuck close to the job for many years, in spite of these difficulties."

Unworkable By-laws

Montreal, too, has had many difficulties in the matter of unworkable by-laws, etc. For many months the new proposed by-laws as affecting the building activities of various trades in the city of Montreal, have been under consideration. SANITARY ENGINEER has already pointed out how anxious the plumbing fraternity was to have these laws suited to the best interests of the house owner, as well as of the trade, and to this end a strong committee of the masters has been giving close attention to a report they were asked to bring in on the subject, by the Administrative Commission of the city of Montreal. This report has been completed, and handed in by the chairman of the plumbers' committee, P. C. Ogilvie, who, personally, has spent many long hours at this work, as well as other members of the committee. This task was the second one in which Mr. Ogilvie had assisted, the new by-laws adopted by the city of Westmount recently having had his attention.

Mr. Ogilvie, in speaking with SANITARY ENGINEER, stated that he expected the by-laws, as embodying the recommendations of the plumbers, would be adopted, and he hoped, without material change. Great care had been taken to make them effective, and to protect the interests of the owner, as well as of the craft.

Educate the Public

Captain Bethune stated that he thought the average owner had come to realize that prices were unlikely to materially decline. As a consequence, there was likely to be greater progress in the year ahead than there has been in 1919. That is to say, work that has been deferred will now have to be overtaken and at once accomplished. It cannot be delayed longer.

The public has often been hard on the plumber, and as the new president stated above, "it is only the man who has stuck to the job a long while who has made any money." He will still have to maintain his own ideas as to the standard of work to be done, and if backed by the city with a good, strong, workable and practical by-law, and under which one man must work just the same as his brother plumber, it ought to make for a fair and just competition, in which all will get their share of the work to be done. With housing sorely needed in all parts of the city in 1920, there should, manifestly, be great progress in the year almost upon us.

Better Feeling Now

Mr. Ogilvie, asked as to the results of the strike, expressed his belief that the English-speaking shops had been the greatest sufferers. Now, however, he feels that there is a better feeling, and a more charitable understanding, which augurs well for the coming season.

James Ballantyne, one of the old-time masters, also feels that the strike troubles are at an end, and that better conditions will prevail from this time forward. As chairman of the committee to confer with the men regarding wages, etc., Mr. Ballantyne asked that leave be granted to continue this work, and this was agreed to.

Hickey and Aubut have plumbing contract for $20,000 alterations in building for F. P. Jones, 207 Stanley St., Montreal.

Great Activity Looked For in Building

Every Indication That the Spring Season of 1920 Will See All Past Records in Canada Smashed—If Weather is Open Considerable Construction Will Proceed During the Winter Months

AN experiment in connection with relieving the housing scarcity is to be tried out in Toronto in the shape of what is known as the "quadruplex bungalow." The plan will, it is expected, be watched with a good deal of interest all over the country by municipalities who have to meet the problem of house shortage.

The "quadruplex bungalow" idea, as advanced by W. E. Dyer, was unanimously endorsed by the Property Committee and recommended to the city council. Mr. Dyer asked permission to establish a group of thirteen of these structures, comprising fifty dwellings, to be operated on a rental basis under the control of the Toronto Housing Company, which was, he said, prepared to accept the responsibility.

Will Be Distributed

The site selected for these dwellings is the Toronto Housing Company's property and the plan submitted indicated that they would be distributed six on either side, with one at the north end. The last would include only two dwellings, the remainder four each. The central portion of the block is shown as a park playground.

With Mr. Dyer, Mrs. L. A. Hamilton, H. W. Davidson and V. Kearns-Batchelor spoke in support of the proposal. They asserted also that it had met with the approval of Lord Leverhulme, whose employees are housed under similar conditions at Port Sunlight.

Building Activity

Advices from all parts of the country indicate that great building activity is expected. Architects are very busy with plans and a feature of the work they have on hand so far is the large number of the better class of dwelling houses. Many of the homes that are planned are of a type that will cost from $4.000 to $7,000. The moderate sized, comfortable, homey style of dwelling seems to be decidedly popular.

The construction of these will not be in the cities alone. Out in the country districts scores of farmers, who have been making handsome profits out of their produce, are figuring on erecting new dwellings.

Housing Commissions

Housing commissions all over the country are busy with plans and the expenditure already in sight from this source alone will run into several millions. While these homes are not of the higher-priced kind, they will, in the great majority of cases, call for substantial construction and many excellent opportunities will be afforded to hardware merchants to supply various lines.

An encouraging feature from a construction standpoint is the attitude being shown by many of the labor unions. Apparently they are realizing that labor unrest has resulted during the present year in several million dollars' worth of building being held up. In order to avoid this during 1920 and restore confidence, they are endeavoring to unify agreements in the various trades and have an understanding arrived at at an early date, so that construction may be commenced early and proceed without interruption.

Build During Winter

There is every indication that if weather conditions are at all favorable a good deal of construction work will be commenced during the winter. If the weather is open as it was last year, a great deal of work could be proceeded with. Many of those who commenced operations during the fall and have been held up through inability to secure shipments of brick or other commodities, are planning to go ahead with the work as soon as they can get the materials. This will also mean considerable activity.

"WHY THE LINE OF PEOPLE AT SMITH'S HOUSE -"
"HOUSE HUNTERS - IT WAS RUMORED THAT THE SMITH'S ARE MOVING OUT NEXT SPRING-
Chamberlain

From Ottawa comes word that to avoid any possibility of strikes or disagreements over hours or wages in the building trades next year, when exceptional activity in construction is expected, steps will be taken early to reach an agreement between employers and men engaged in the building trades.

This unusually early move towards an agreement on wages is due to the unrest that has been evident this year, the many big works to be estimated on for next year, and the fact that there has been dissatisfaction in some branches of construction work recently regarding wages and also employment of unskilled men on some jobs unions hold to be work for their men.

At the annual meeting of the Ottawa branch of the Canadian Building and Construction Industries next Wednesday, Mr. Hugh Graham will move that a committee be appointed to consider drafting an agreement with the employees at an early date.

"Our windows are one of the very best advertisements our store has," says Mr. Heaman. As may be seen from the illustration, he keeps them attractively dressed and the displays are changed regularly. Note the little shelf displays of aluminumware and tinware at the left. These make a great hit with the farmers' wives.

Keep Your Stock Well Displayed

"Best Way I Know of Increasing Sales," Says W. J. Heaman, of Exeter, Ont.—Good Window Displays and Attractive Store Arrangement Backed by Timely Advertising Always Produces Results

Based on an interview by C. E. PARSONS, of Sanitary Engineer, with W. J. Heaman, of Exeter, Ont.

"KEEP your stock out where people can see it, and don't be afraid to advertise. Our window displays are among the very best advertisements we have, and when backed by newspaper copy, never fail to produce results."

This is the opinion of W. J. Heaman, Exeter, Ont., hardware and plumbing. Exeter has a population of about 1,700, and is the centre of a rich farming district. Mr. Heaman's windows are given careful attention, and are changed regularly. Both store and windows are always kept clean and attractive.

Mr. Heaman does not believe in keeping his stock hidden away down cellar, or in drawers or under the counter.

The first thing that strikes you when you enter the store is that he has a good stock and that you would be likely to get anything there you might want in the hardware or plumbing goods line.

"We try to keep our stock out where it can be seen," said Mr. Heaman. "That is the best plan I know of to keep it moving. We keep it changed around a good deal, and always aim to keep seasonable lines up to the front. We use display stands and display tables and find that they are a great help in increasing turnovers."

Windows Good Ads.

Mr. Heaman says his two windows are perhaps the best ad. he has, and he believes thoroughly in advertising. The windows are changed regularly every week and are backed up by timely advertising in the local paper. Mr. Heaman always uses a double column space on the front page in the lower left hand corner.

"We think it is good business to keep the same position each week the year round," said Mr. Heaman. "People learn to look right in that spot for our announcements. We do not always use the same space. At special seasons we use two or three times as much space as at others, but we aim always to have a seasonable message that will tell about our stock and our store to the people of the whole district."

Brings in Business

Mr. Heaman does an excellent business with the farmers, not only in hardware goods, but in plumbing also.

"There are no better customers than the farmers," he said. "They are good buyers. They have the money and they do not mind paying fair prices for good goods. That is one thing they insist on. They want something for their money. It is never a question of price, but of quality."

Mr. Heaman says he gets good results from his newspaper ads. They are no sooner in circulation than business starts to come. Some of it comes in from the town direct. More comes in from the country over the rural telephone lines, and the general total is swelled by the visits of farmers who motor into town.

50 Per Cent. Own Cars

"The advent of the auto has made a wonderful change in the rural business," said Mr. Heaman. "Fifty per cent. of the farmers in this county own their own autos now and think nothing of coming in twenty or twenty-five miles. It would surprise you to see the automobiles here on Saturday nights. In the two short blocks in the vicinity of the store I have counted no less than ninety cars. There were many more in other parts of the town. That means a lot of business of course."

Mr. Heaman has two Bowser pumps to supply gasoline to auto owners. He also sells spark plugs, automobile oils, accessories and oil for tractors.

"There are at least twenty tractors in this section now," he said. "No doubt the number will greatly increase. We find our sales of oils and accessories for both autos and tractors mounting steadily."

Go Well Together

In his district Mr. Heaman finds that hardware and plumbing go well together. The farmers, he says, are continually improving their homes and there is a steady call for water systems, bathroom equipment, bathroom fixtures and other lines. As may be seen, Mr. Heaman keeps one of his windows filled with plumbing goods. The outfit in the illustration had been sold to a farmer many miles out in the country, and was put in the window. It was a good ad. for the firm as it not only made a nice display, but it started all the farmers in the district talking about what a lot of improvements ——— was making at his home.

The plumbing department in the Heaman store is kept busy all the year

Continued on page 32

¶ "I do not foresee any change from our present measure of prosperity for at least five years, probably for seven. The world is face to face with a famine of essentials. The shelves of the grocer, the draper and the hardware merchant are bare, the ships that we need to bear our trade are yet to build. Everywhere people are needing goods that they cannot buy at any price because the goods are not there to purchase. While these conditions last, while all the world is a buyer, there can be no thought of hard times."

Prosperity Assured for Years to Come

An Interview with

LORD LEVERHULME.

The world has been very full of croakers of late years, and a change in the tone of the music comes gratefully to the ear. Certainly no one could accuse Lord Leverhulme of Port Sunlight, England, head of the great Lever Brothers soap business, and one of the largest employers of labor in the world, of being a croaker; no one could accuse him either of being a man of incautious judgment. He stands as one of the big business men of the world and frankly declares himself an "incurable optimist," not only in regard to general affairs, but in regard to the present disturbed business conditions, and the somewhat uncertain future. "I do not foresee any change from our present measure of prosperity for at least five years, and probably seven," stated Lord Leverhulme to SANITARY ENGINEER. "The world is face to face with a famine of essentials. There are too few ships to provide for our needs, there are bare shelves. The shelves of the grocer, the draper and the hardware merchant are bare, and the ships that we need to bear our trade are yet to build. Everywhere people are needing goods that they cannot buy at any price, because the goods are not there to purchase. This condition cannot be remedied in a day. It will be years before production can equal demand, and until it does there will be a ready market for everything that can be produced, and that is so, I believe, quite despite present exorbitant prices. People will pay these prices because only by so doing can they supply their needs. While such conditions last, while the world is a buyer, there can be no thought of hard times. That is the condition existing in this first period of reconstruction, as I see it, and that is a condition that I believe will certainly exist for a period varying from five to seven years. I do not think that in this time any conditions can arise that will greatly modify this judgment.

Wage Reduction a Catastrophe

"In what might be called the secondary period, the period that will follow the time when the world's production has again been brought equal to the demand, the stability of business conditions will be contingent upon two factors: the continuance of present wage conditions to the worker, and a reduced production price that will permit of lower prices. In my opinion, any reduction in wages would be a catastrophe and would unquestionably result in one of those periods of depression that we have had from time to time. Any lowering in the wage market, and such will be the case if industries are shut down and the labor market becomes flooded with excess labor, will react sharply on business and will bring about a condition of hard times.

"On the other hand the laborer must be brought to see the fallacy of the doctrine held by some that a re-distribution of wealth would afford any remedy. You might as well say that the mortgage on the home could be raised by rearranging the furniture. Re-arrange it as much as you like, but the mortgage would still be there till someone goes out and takes off his coat and earns the money to raise it. The thing we must look forward to is when the workingman's five dollars can buy seven dollars' worth of goods as they are at present prices, but such things can only be if the workers as a whole, and that means most of us, for we are all of us bartering one sort of labor for another, are prepared to work to raise the mortgage. The high prices of goods is ninety per cent. paid by the working class and if they neglect the production that would lower prices they are merely raising prices on themselves.

"A reduced production price depends on the co-operation of labor, and on sound economic handling. For instance," said Lord Leverhulme, "there was a man in here a short time ago showing us a machine that would do the work of ten men. Now when you have one man doing the work of ten, then you have a

costs reduced, you naturally have a commodity that can be sold at lower prices. What of the nine men whose services are disposed of? They will be making the machine that saves the labor and handling the excess production. It is merely a re-arrangement of labor that leaves everyone employed and producing more.

Larger Production—Lower Prices

"With larger production there must come lower prices; lower prices are made possible by better business system, and with the laborers' wages maintained there is a buyer for all the goods that can be produced. Such conditions will mean an indefinite continuance of prosperity.

Prosperity Outstrips Debt

"As for the financial aspect, I do not think that there is ground for fear. At the close of the Napoleonic wars Britain had a debt of eight hundred million. That is taking in the British Empire alone. Our present debt is estimated at somewhere about six thousand million, add in the debt of all other parts of the Empire and the total debt will yet be less than eight thousand million. Ten times as much as that of the Napoleonic wars, but is anyone foolish enough to believe that our resources are not ten times greater than then? Why, take Canada, her resources are a thousand times and more greater than they were in the Napoleonic era. Australia had only been discovered by Captain Cook a few years before. Africa had practically no resources, and the resources of India were a mere bagatelle. Why our resources were scarcely touched in those days. To-day they are certainly many times more than ten times as great, and if a time of undreamed of prosperity followed on those uncertain days, why should we fear any disastrous financial conditions now? As I said I am an optimist and I can see only good times ahead."

MARKET CONDITIONS

Continued from page 38

pound. Lead traps and bends also advanced, showing about 10 per cent. higher prices, which are as follows:

Lead pipe, list, per lb.	0 13½
Lead waste pipe, list, per lb.	0 14½
Do., over 8 inches, list, per lb.	0 15½
Above subject to discount of 10%.	
Lead traps and bends	5%
Lead wool, lb.	0 16
Lead sheets, 4 to 8 lbs., sq. ft., in rolls, lb.	0 10½
Cut sheets ½c to ¾c lb. extra, and cut sheets to size, 1c lb. extra.	
Solder, guaranteed	0 34 0 35½
Solder, strictly, lb.	0 33 0 34½
Solder, commercial, lb.	0 31 0 32½
Solder, wiping, lb.	0 30 0 31½
Solder, wire, lb.	0 42¼ 0 35½
Zinc sheets, per lb.	....

Soil Pipe Still Scarce; Prices Firm Unchanged

SOIL PIPE.—The demand for soil pipe for this season of the year is very heavy. Many are looking for an enormous business this coming year. It has been stated that soil pipe is out of line with foundry costs, but the constant demand, with short supplies, will, it is believed, keep prices on a firm basis well into the second quarter. The following are the present quotations:

Medium and extra heavy soil pipe, 2, 3 5 and 6 in.	10%
Medium and extra heavy soil pipe, 4 in.	15%
Medium and extra heavy soil pipe fittings, 2 in. to 6 in.	25%
8 in. extra heavy pipe and fittings	5%
PIPE FITTINGS	
Cast iron fittings	10%
Plugs	22%
Bushings	25%
Unions, ¼" to 2½"	40%

General Manager of Peckovers, Limited

Announcement is made of the formation of a new warehousing, jobbing and importing company in Toronto under the name of Peckovers Ltd. J. G. Near, for the past eighteen years with the firm of Drummond, McCall, has been named as general manager.

The principals in the firm are C. R. Peckover, of the firm of Baines and

J. G. NEAR

Of Toronto, who has been appointed general manager of Peckovers Limited

Peckover, and Mr. Near. Mr. Peckover came to Canada twenty-three years ago from Scranton, and was with the hardware firm of Rice Lewis & Son, Ltd., Toronto.

The new firm's location is at Spadina Avenue and Fleet Street. The company is capitalized at $500,000.

Do., ¼", 3" and larger	35%
Dart unions, ¼-inch to 2-inch	25%
Do., 2½-inch and larger	15%
Nipples, up to 4 inch	70%
Do., 4½-inch and larger	60%
Do., running thread 4-in. and under	40%
Couplings, 4-in. and under	35%
Do., 4½-inch and larger	15%

MALLEABLE FITTINGS

	Black	Galv'd
Malleable Fittings, Class A, lb.	$0 57	$0 72
Do., Class B, lb. net	0 25	0 35
Do., Class C, lb. net	0 19	0 25

Waste and Oakum Firm; Prices Remain Unchanged

WASTE AND OAKUM.—Owing to the lateness of the season the demand for these have fallen off. However, one of the best seasons have been experienced, and prospects for 1920 are very favorable, and a large business is expected. The following are quotations:

	Per 100 lbs.	
Best American	$21 00	$22 00
Clipper, spun	....	21 00
Do., unspun	....	19 50
Plumbers' spun	10 00	10 75
WASTE		
Cream, Polishing	....	0 21
White—		
XXX	....	0 18
XX	....	0 16¾
X	....	0 15¾
XC	....	0 13½
Japanese	....	0 13
XXX Extra	....	0 19
XX, grand	....	0 17¾
XLCR	....	0 16½
X Empire	....	0 15¼
X Press	....	0 14
Colored—		
No. 5	....	0 13¾
No. 1	....	0 12¾
No. 7	....	0 11¾
No. 1A	....	0 10¾
No. 1B	....	0 09¾
Fancy	....	0 15
Lion	....	0 13½
Standard	....	0 12
Popular	....	0 10½
Keen	....	0 09

Above lines subject to trade discount for quantity.

Spelter and Lead Up ¼c; Other Ingots Firm

INGOT METALS.—A great number are interested in the first delivery of copper for 1920. Some have it that numerous producers have withdrawn from the market. Tin still is showing advances as well as lead. The whole ingot list in fact is reported to be showing strength. Many are looking to the new year and expect a great amount of business to take place. It is believed that 1920 will be a great year of expansion, and tremendous demands in all lines are expected.

TIN.—The primary market continues to record advances in tin, but this is neutralized by the high rate of exchange. The present quotations are 60 cents per pound.

LEAD.—An upward tendency is noted, and this week's price shows an increase of ¼ cent per pound, making the present price 8¾ cents per pound.

COPPER.—Great interest is being shown in the first delivery of 1920 copper, and it is stated that numerous producers have withdrawn from the market. The present price is quoted at 24 cents per pound.

SPELTER.—Spelter is showing a good demand and continues very active, the present price is 11 cents per pound, and the tendency is for stronger prices.

ANTIMONY.—Shows a normal demand, and a fair movement is noted. The prices being quoted are 11½ cents per pound.

ALUMINUM. — Aluminum is quiet. Quotations remain at 34 cents per pound.

Heating and Ventilating

Ventilating the Modern School

Seventeenth and Concluding Article of Series Written Especially for "Sanitary Engineer" by N. A. Kearns—First Article of Series Appeared in April 1 Issue

IF the reader will turn back to the June 1 number of the SANITARY ENGINEER, he will find that the fourth article of this series gave certain of the guiding principles of gravity ventilating systems. Now, we wish to show how the principles explained in that article are followed when the circumstances of design make necessary the use of apparatuses differing, somewhat, in detail from those shown in that article.

Some of the details here described are identical in application, both for the system as it appeared in the June article and for the system as it is now presented. We are, therefore, showing details that may be used in almost any type of a gravity ventilating plant, but in doing so we do not wish the reader to understand that these drawings illustrate any standard apparatus.

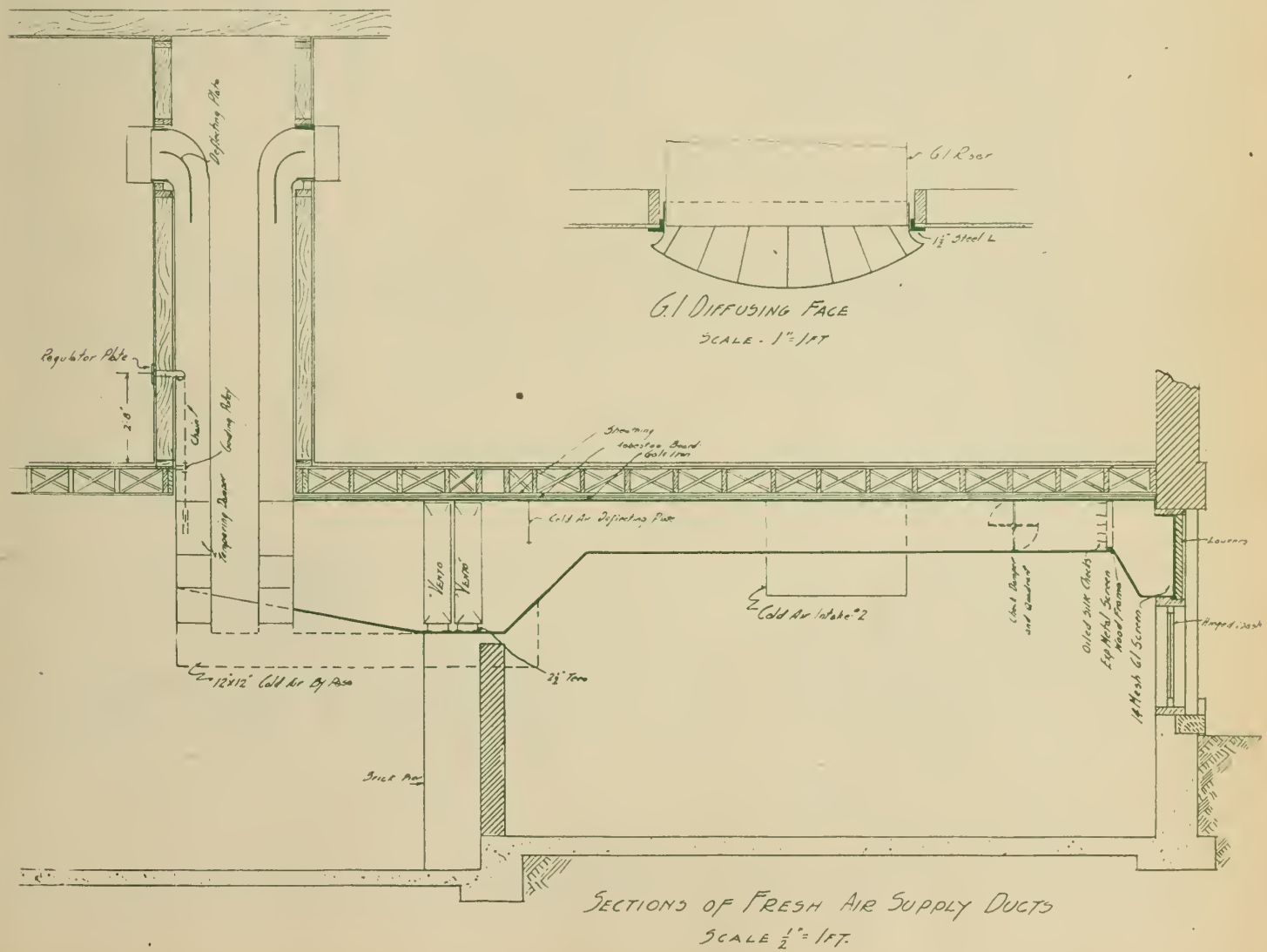
The ventilating plant shown by the accompanying cuts is to be installed in a one-storey building containing two standard class rooms, an assembly hall, a library, two small class rooms, and a principal's office.

The heating system will be of the one pipe steam type, with all class room radiators fitted with radiant heat shields.

Fresh Air Supply Ducts

The drawings showing the fresh air supply ducts indicate how the fresh air is admitted to the class rooms by way of galvanized iron ducts, wherein there is a heater placed that warms to the required temperatures the air for ventilation.

The cold air enters the ducts through openings placed in the outside walls. It will be noticed that there is a louvered sash placed in the cold air inlet to pre-



vent the inward driving of snow, sleet, or rain. The louvers may be made of metal or of wood. At the back of the louvers a galvanized wire screen should be placed for the purpose of keeping birds and insects out of the ducts.

Back-Draft Dampers

At a little way farther on in the duct we come to a back-draft check. These checks are simply strips of oiled silk placed horizontally on, and hanging over, a screen made of expanded metal mesh. The purpose of the back check is to prevent the escape of air from the building in the event of a back-draft occurring. The oiled silk is so light that the pressure of the incoming cold air is sufficient to lift a damper made of that material away from the openings in the mesh. The metal screen prevents the dampers from swinging back towards the cold air inlet.

A similar damper, but made of heavier material than of oiled silk, is often used in foul air exhausts.

Check Dampers

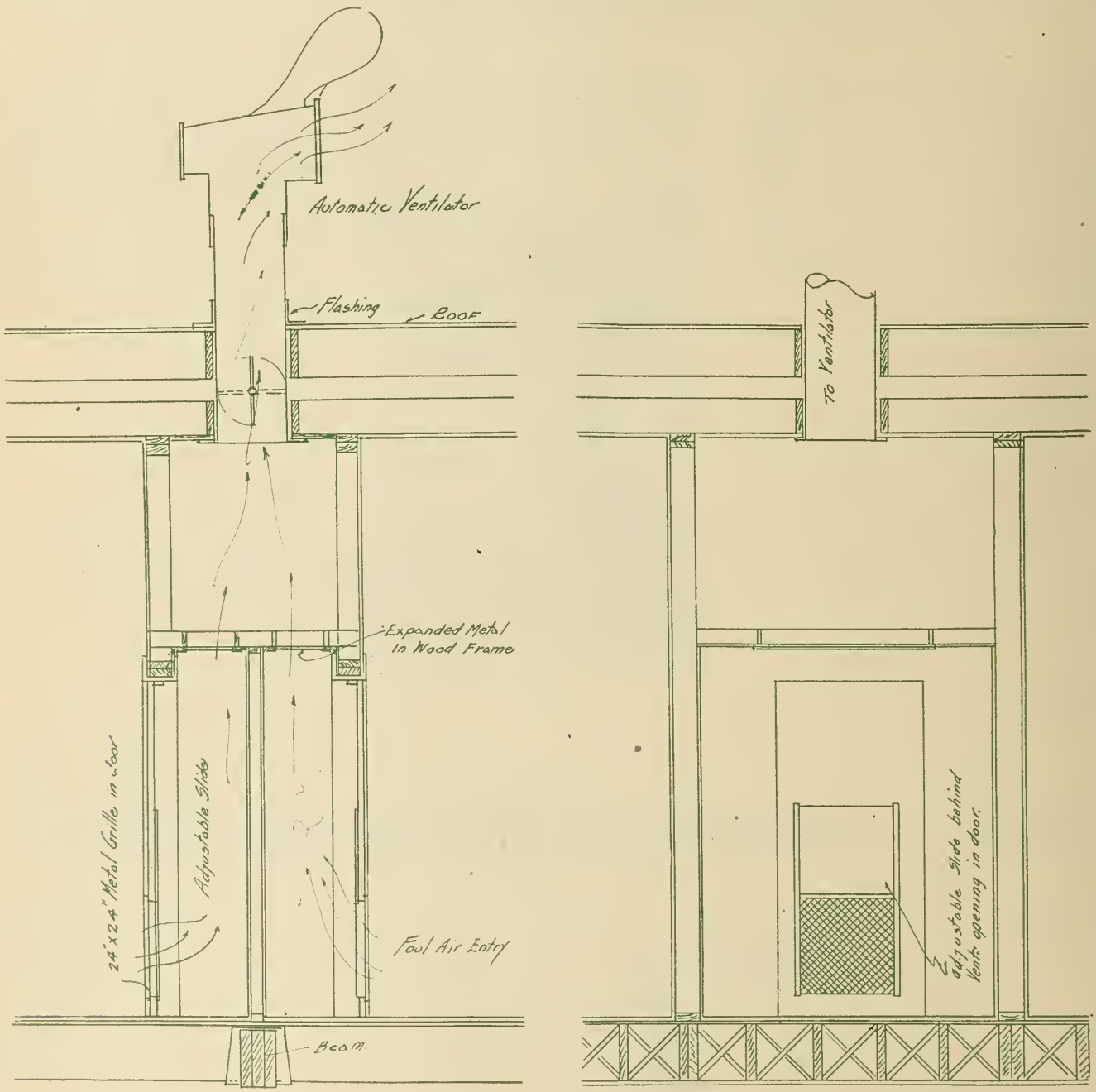
Each cold air inlet is fitted with a revolving damper; the purpose of which is to close, or partly reduce, the area of the fresh, cold air intake. These dampers are to be fitted with operating handles and quadrants that hold the dampers in any desired position.

Two Cold Air Inlets

Two cold air inlets are provided, so that either, or both, may be used as the conditions of outdoor winds and weather may warrant. If only one inlet was provided, the outer wind currents, when moving in certain directions, would draw outwards on the fresh air supply channels. That is the reason why inlets are taken from different sides of the building.

Indirect Radiators

The drawing used to illustrate the fourth article of this series showed the



CROSS SECTION LONGITUDINAL SECTION

DETAIL OF FOUL AIR VENTING SYSTEM

indirect radiators placed horizontally in the air-warming chamber. The radiators were there shown close up to the fresh air flues. The drawing we now have before us shows the fresh air flues at some distance from the heater chamber; so it becomes necessary to place the radiators upright, instead of on their sides.

The radiators are supported on steel angles, resting on brick piers.

Steam is fed to the radiators through feed openings in the top of each. The return openings are at the bottom of each rod, and at the opposite end to that of the feed. A two-pipe system is used in connection with the air-warming radiators.

Protection of Cold Air Ducts

Between the joists of the basement ceiling and the cold surfaces of the fresh air intake there must be placed some material for the purpose of preventing the floors above from becoming cold. In this case we have indicated asbestos board and hemlock sheathing. It is also well to cover the sides and the underside of the duct in a like manner. Frequently an air space is formed around the duct by the use of metal lath and asbestos plaster; ordinary lime plaster is of very little value for such a purpose.

Cold Air By-Pass

A small duct connects the cold air intake to an opening in the base of each fresh air flue. The purpose of this duct is to carry unheated air to the flue for use at such times as it may be required in lowering the temperature of the air entering a class room. The double-acting dampers close the by-pass duct when unmixed warm air is alone required.

The mixing damper shown here differs in some respects from that shown in the former article, but its function is exactly the same, viz.: to control the temperature of the air without diminishing the quantity.

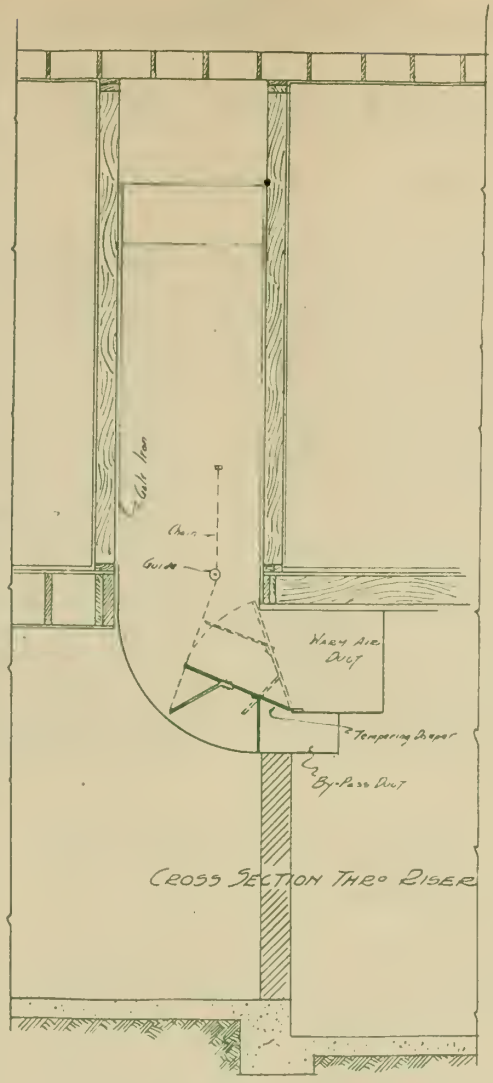
The position of the damper is controlled by a chain, which may be operated from the class room; and as the controlling handle is placed side-on to the damper, it is necessary to provide a guiding pulley, so that the chain may not bind as its lower end follows the arc described by the moving damper.

Mixing dampers, together with their controllers, are of many patterns. One pattern is in the form of a cylinder, hinged so that it may drop over the by-pass opening, or be lifted to close, or partly close, the warm air opening. Another type is in the nature of two separate dampers connected with a rod, so that when one moves the other follows.

Controllers are often in the form of wheels, as well as in pull devices.

Fresh Air Face

About eight feet from the floor line, the tempered fresh air enters the class room, either through an iron grille or a diffusing face; sometimes through a combination of both.



The galvanized iron diffusing face is made, as a rule, just as it is shown on the detail drawing. The base and top of the face is made of heavy galvanized iron, cut in a radius equal to the width of the opening it covers. The vanes, of galvanized iron, radiate as shown; except when the face is set in a corner, the vanes are then turned in such a direction as will deflect the warm air away from the corner walls.

Behind each diffusing face, deflecting plates should be set. If the opening is very deep there should be more than one plate. As a rule, a deflector should be set for every nine inches in the height of the fresh air face.

Foul Air Exhausts

The vitiated air is taken from each class room through an opening placed in the door of the teacher's cupboard. This opening is covered by a metal grille, and is close to the floor line. Behind the metal grille there is a wooden damper, which slides between two guides. The area of the opening can be fixed by adjusting the catches holding the damper in place. On a very cold day the area of the opening can be reduced to suit the strong draft then existing.

The air passes through the cupboard to the ventilator placed on the roof.

Main Vent

The ventilator shown on this drawing is of the type that swings round with the outer air current. With a ventilator of this type there is no necessity of providing back-draft checks in the foul air exhausts; for a back-draft can not occur when, as here, the exhaust opening is always turned away from the wind.

Conclusion

This is the final article of a series wherein we have written much more of the principles used in the designing of ventilating systems than we have of details of equipment.

From time to time, in the future, we hope to present articles illustrated by drawings of various types of ventilating plants. We believe that so far we have covered the groundwork of principles in a way that should make clear the reasons for certain designs of ventilating systems, and we feel that when we do show detailed drawings of the ventilating plant for a school of twenty rooms, or more, our readers will take far more interest in reading the description of such when they understand how the simple details of the plants we have described are governed by exactly the same principles as those followed in the larger and more expensive buildings.

Now, at the conclusion of these articles, we wish to repeat what some wise man has said:

"Get your principles right; the details will take care of themselves."

ENGLISH SHEETS TO BE AVAILABLE

SANITARY ENGINEER is informed by a reliable authority, that English galvanized sheets will be available for the Canadian market within the next five or six weeks. It is stated that several hundred tons of these sheets will be procured at once, and that, despite the high rates prevailing in winter, the needs of the market are such as to justify importation at this season of the year. Under the present market situation, it is interesting and encouraging to note that some relief, even though it may not be extensive at present, will be afforded in due time.

C. A. DUNHAM CO., LIMITED

A new bulletin, "Dunham Heating Data," has just been issued, describing and explaining standard methods of figuring radiation and laying out piping Valuable ventilating data are also included, the whole being put in very practical and concise form, getting at the real information without having to wade through a lot of preliminaries. Various details of piping connections are illustrated, and complete pipe sizing information given. This bulletin, together with several others of interest and value to the stationary and heating engineer, may be secured by writing the C. A. Dunham Co., Ltd., 1535 Davenport Road, Toronto, Ontario.

Market Conditions and Tendencies

Statements Regarding Supplies and Trend of Prices

THE MARKETS AT A GLANCE

DISTINCTLY higher prices are again recorded this week and the price changes are very important. Steel buttweld pipe has advanced and a new list has been issued as shown in the market reports of this issue. Lead traps and bends have advanced 12½ per cent. Lead waste and pipe jumped 1 cent per pound. The prices on porcelain have been withdrawn and higher prices will go into effect.

A very important measure is being almost generally adopted on account of the high rate of exchange and many manufacturers are adding the exchange at time of shipment to the net price of the goods, and as this exchange has been hovering around 10 per cent., this measure will practically be equal to a 7 per cent. advance on all goods of United States manufacture.

The enamelware situation appears to be on the mend and manufacturers claim they can overtake their present orders and be able to give better deliveries in the spring, when great activity is again expected in the building line.

All indications point to 1920 as being a great year of expansion and tremendous demands are expected in all lines. The shortages now noticed would not surprise some of the best informed if they were increased, as mills are said to have enormous orders of the present year to fill and which are nowhere near completed on account of the many disturbances which have occurred.

TORONTO, December 15.—The upward tendency in all lines of plumbing and sanitary supplies is very marked. The high rate of exchange is another very important feature. Manufacturers and jobbers almost generally are adopting a system of adding the exchange at the time of shipment to the net price of goods. This exchange has been hovering around 10 per cent. and will mean that this measure will practically raise the price of goods of United States manufacture 10 per cent.

All indications point to 1920 as being a great year of expansion, and the demand in all lines, it is expected, will be tremendous. It is believed if this is the case that there will be many shortages as mills have enormous orders of the present year to fill and which are nowhere near completed on account of the many disturbances, etc.

Some of the prices changes are: Lead traps and bends have jumped 12½ per cent.; lead waste and pipe advanced 1 cent per pound. Prices have been withdrawn on porcelain, and higher prices will be named. Steel pipe also has advanced and is quoting from a list of December 9, No. 12.

Prices Withdrawn On Porcelain Ware

PORCELAIN WARE.—All quotations on this commodity have been withdrawn and orders bearing post mark later than December 12 will be filled at new and higher prices. This is, to some extent, unexpected, and although porcelain has been quite firm, no higher prices were looked for, especially with the settling in of cold weather. The high rate of exchange may have something to do with these prices, also the labor disruptions, which it is hoped, are now settled, as production in all lines is very low.

Compression and Brass Work Unchanged; Weak

PLUMBERS' BRASS AND COMPRESSION WORK is holding steady, but, owing to the European and others not coming into the market for brass and copper, the price is unsteady and a lower price would not be unexpected. Manufacturers and jobbers are adopting a 5 per cent. increase on all American goods, owing to the high rate of exchange. Quotations for some of the better known lines are as follows:

Compression work, standard	28%
Fuller work, standard	34%
Bath cocks, compression	30%
Bath cocks, Fuller	34%
Flatway stop and waste cocks, standard	32%
Roundway stop and waste cocks, standard	32%
Brass steam cocks, standard	Net List
Globe, angle and check vales, standard	5-9%
Do., removable disc	7-10%
Radiator valves, standard	15%-23%
Do., removable disc	40-46%
Basin Cocks	
No. 0 and 1, Fuller pattern	34%
Compression	23%
Quick opening	34%

Enamelware Scarce; Price Remains Unchanged

ENAMELWARE continues to show a brisk demand, many houses being covered, and nearly finished, continue to create considerable movement. Manufacturers, it is stated, believe that the shortage in bath tubs will automatically be relieved, and that they will be in a good position to supply the requirements of the coming year. It is sincerely hoped by all that labor will be more settled and that conditions will go back to a better production basis during 1920.

The high rate of exchange is getting to be a serious factor in the merchandising of goods, and many are charging the exchange rate at time of delivery, as a net extra on the goods. The following are the prices on some of the better known lines.

Bath tubs, roll rim, 4. 4½, 5 feet, 24 to 30 in. wide			$37 05
Bath tubs, 5½ ft.			41 20
Lavatories—			
17x10" Apron F139 or P4345			11 05
18x24" Apron F154 or P3845 or P3847			17 00
18x21" Apron F169 or P4205			12 70
18x21" Roll rim F197, F199 or P4655-6			11 10
17x19" Roll rim F241 or P4345			9.05
Sinks, roll rim, 18 x 30 in.			16 60
Sinks, flat rim—	1 only	2 only	3 only
16 x 24	$5 40	$5 35	$5 30
18 x 30	6 20	6 50	6 10
20 x 30	7 10	7 05	7 00
Closets, oak tank and seat			28 50
Do., enamel iron or white vitro tank			31 00

Stove Plate and Other Scrap Metals Higher

WASTE MATERIAL has shown considerable activity lately and scrap iron and other scrap metals are quoting at slightly higher prices, but showing stronger tendencies, it is stated. Copper, lead and zinc, etc., are showing weaker tendencies and are apparently awaiting developments, whether they will advance or decline. The market for old boots, rubbers, etc., is very quiet. The following are quotations:

DEALERS' BUYING PRICES

Tea lead	....	0 03½
Heavy lead pipe	....	0 05¾
Pipe scrap	....	10 00
Stove plate, per ton	....	17 50
No. 2 busheling	....	11 00
Yellow brass	....	0 10
Red brass	....	0 15¼
Light brass	....	0 07
Scrap zinc	....	0 05
Heavy copper	....	0 17
Wrought iron, No. 1, per gr. ton	....	11 00
No. 1 machinery cast	....	22 00

HERE'S Christmas again. A season of happiness and good cheer everywhere.

Christmas Greetings

and Good Wishes To All

IN wishing you all the compliments of the season we express the hope that you have had a prosperous year.

We extend the wish for a happy and prosperous year during 1920.

H. Mueller Manufacturing Co., Ltd.

SARNIA, CANADA

Heavy melting steel	....	14 00
Old rubbers, boots and shoes	....	0 06
Overshoes, lumbermen's rubber boots	...	0 04
Bicycle tires	....	0 01½
Automobile tires	....	0 03
Tea lead	....	0 03
Heavy lead pipe	....	0 05¾

Sheets and Plates Firm; Famine May Be Relieved

SHEETS AND PLATES. The serious shortage in this commodity may be slightly relieved, for immediate delivery, in small quantities. Booked orders and all future deliveries seem out of the question, for at least two or three months. The high rate of exchange is a new factor the manufacturer and jobber have to contend with. Although this has been fluctuating continually, it has seldom been far from the 10 per cent. mark; this naturally makes the goods coming from the States 10 per cent. higher. Rather than advance the price of goods, it is stated that, generally, manufacturers and jobbers are charging the exchange as a net extra over base price. The following are quotations. Owing to the scarcity and unsettled conditions of the markets locally it is almost impossible to quote accurate prices, as nearly all who have stocks have procured them under unusual conditions, and sheets, galvanized, 10¾ oz., for instance, are quoting anywhere from $8.50 to $10.00 per 100 lbs.

BLACK SHEETS—		
14 gauge	5 15	6 50
16 gauge	5 90	6 95
18-20 gauge	5 45	6 85
22-24 gauge	6 50	6 90
26 gauge	6 60	6 95
28 gauge	6 75	7 05
3-16 inch plate	5 20	5 55
¼-inch boiler plate	4 80	6 10

Prices shown are for full cases. An extra charge of from 25c per 100 lbs. is made for less than case lots.

GALVANIZED SHEETS—	Premier		Apollo	
10¾ oz.	$9 20	$9 80	$8 55	$9 55
U.S. 28	8 60	10 20	8 15	8 85
U.S. 26	8 20	8 80	7 85	8 50
22 and 24	8 00	8 20	7 70	7 30
18 and 20	7 80	8 00	7 55	8 10
16	7 55	7 80	7 40	7 90
12 and 14	7 35	7 55	7 25	7 65

An extra is now charged on galvanized sheets, 10¾ oz. and 28 ga. when shipped out in sheets 3 feet wide. The extra charged over prices shown above is 20c per 100 pounds. Other gauges show no change for different widths.

Prices shown are for full cases. An extra charge of 25c per 100 lbs. is made for less than case lots.

Boiler Tubes Firm; May Soon Be Advanced

BOILER TUBES.—An advance in boiler tubes would not surprise many of the best informed and it is believed that some expect a change almost daily. Boiler tubes have been notably scarce, no business is being turned down. The coal and other strikes appear to be the main factors.

Owing to the high rate of exchange, manufacturers and jobbers, generally, are charging a higher price for goods coming from the U.S.A. in order to overcome this high rate, which is about equal to a 10 per cent. advance.

BOILER TUBES—	Per 100 feet Seamless	Lapweld
1 inch	$27 00	$.....
1¼ inch	29 00	.....
1½ inch	29 50	.....
1¾ inch	32 00	27 00
2 inch	31 00	26 00
2¼ inch	35 00	28 00
2½ inch	43 00	32 00
3 inch	48 00	40 00
3¼ inch	.....	17 00
3½ inch	60 00	44 00
4 inch	75 00	56 00

Range Boilers Unsettled; May Advance Soon

RANGE BOILERS.—Owing to the unsettled condition of the iron and steel market, range boilers may advance, and this may take place any time soon, it is expected. Any orders taken now are contingent with the exchange rates, which, of late, have soared to such heights. There are many houses that are covered, and range boilers continue in excellent demand, for this season of the year.

Range Boilers	Standard	Extra Heavy
30-gallon	$11 00	$12 50
35-gallon	13 50	15 50
40-gallon	15 25	17 25
52-gallon	20 50	25 00
66-gallon	32 00	38 00
82-gallon	40 00	47 00
100-gallon	50 00	58 00
120-gallon	60 00	67 00

Wrought Nipples Advance 5% New Price Firm

NIPPLES AND COUPLINGS.—An advance of 5 per cent. has taken place in nipples, and they are now quoting at: Nipples, up to 4 inch, list, less 70 per cent.; 4½ inch, and larger, list, less 60 per cent.; 4 inch, and under, list, less 10 per cent.

Advance of 1 to 2 Points On Steel Buttweld Pipe

STEEL PIPE.—Standard steel buttwelded pipe has again advanced. The new price is a firm one, but may ease up later, according to any developments which may occur in skelp later on.

Manufacturers and jobbers alike seem to think that there is no doubt about the demand, but rather are more concerned over the supply. It is stated that from present indications, all the output available will be required for 1920, and everyone is hoping for industry to settle back to the old stride, if possible. Following are the quotations:

WROUGHT PIPE
Price List No. 42, Dec. 9, 1919.

	Standard Buttweld Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
⅛ in.	$6 00	$8 00	$.....	$.....
¼ in.	4 65	6 78	5 13	7 26
⅜ in.	4 65	6 78	5 13	7 26
½ in.	6 16	7 74	6 84	8 42
¾ in.	7 76	9 89	8 68	10 81
1 in.	11 18	14 62	12 84	15 98
1¼ in.	15 53	19 78	17 37	21 62
1½ in.	18 56	23 65	20 76	25 85
2 in.	24 98	31 82	27 94	34 78
2½ in.	39 49	50 31	.....	.....
3 in.	51 64	65 79	.....	.....
3½ in.	65 78	82 80	.....	.....
4 in.	77 94	98 10	.....	.....

	Standard Lapweld Steel Blk.	Steel Gal.	Gen. Wrot. Iron Blk.	Gen. Wrot. Iron Gal.
	Per 100 feet			
2 in.	$ 27 94	$ 34 78	$ 31 64	$ 38 11
2½ in.	40 66	51 48	46 51	57 33
3 in.	53 17	67 32	60 82	74 97
3½ in.	66 70	83 72	75 90	92 92
4 in.	79 03	99 19	89 93	110 09
4½ in.	88 00	113 00	114 00	138 00
5 in.	103 00	132 00	132 00	161 00
6 in.	133 00	171 00	172 00	209 00
7 in.	175 00	224 00	223 00	271 00
8L in	184 00	235 00	234 00	285 00
8 in.	212 00	271 00	269 00	328 00
9 in.	254 00	324 00	323 00	393 00
10L in.	235 00	301 00	299 00	365 00
10 in.	303 00	387 00	385 00	470 00

Terms, 2% 30 days, approved credit.
Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Conductor Pipe Firm; May Soon Advance

CONDUCTOR PIPE.—The sales of this commodity have been excellent, even through most of the cold weather. So far no change in price is noted. It is stated by the manufacturers that they had anticipated a large volume of business and had made preparations accordingly. When the strike came, causing the extreme shortage in galvanized sheets which now exists, it is stated they had considerable stock made up and did not take advantage of the scarcity to charge premiums on this stock. It is hard to state what will happen, though, as it is claimed these stocks are nearly exhausted now, and when new stock is made up, unless the situation is relieved manufacturers will be forced to buy on a higher market and naturally would have to base their product on actual costs.

PIPE (Conductor) Plain	
2 in., in 10-ft. lengths, list	8 00
3 in., in 10- ft. lengths, list	9 70
4 in., in 10-ft. lengths, list	12 80
5 in., in 10-ft. lengths, list	17 50
6 in., in 10-ft. lengths, list	21 30

F.o.b. Toronto, Ottawa, Oshawa.
List less 10%.

Lead Pipe Up 1c Pound; Traps and Bends Higher

LEAD AND ZINC PRODUCTS.—An advance has taken place throughout most of these products. Lead pipe and waste pipe having advanced 1 cent per

Continued on page 32

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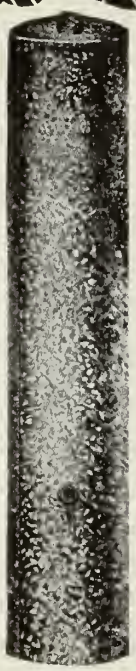

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The cut showing the strip of metal is proof of the strength of the Electric Weld Under mechanically applied tension the weld sustained a

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our new factory in Toronto for
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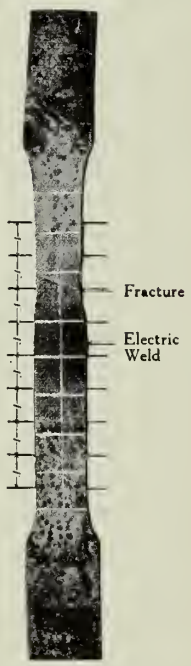

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Greetings

To every Sanitary and Heating Engineer, throughout the Dominion of Canada, I wish to extend fraternal greetings and wish them and theirs, good health and happiness at this Christmas season of 1919, and prosperity for the New Year of 1920.

To the many connected with the Plumbing and Heating Industry of our Dominion, my message is one of optimism, for I can see a vaster field than has ever been before for the endeavors of those whose duty it is to care for the Sanitary and Heating requirements of our country.

Let everyone assume their share of same and see that well done is their portion.

With the officers and the members of the Canadian Society of Domestic Sanitary and Heating Engineers, I join in wishing

ONE AND ALL

A Merry Christmas and a Happy New Year

Frank R. Maxwell,
President

Address all Communications to
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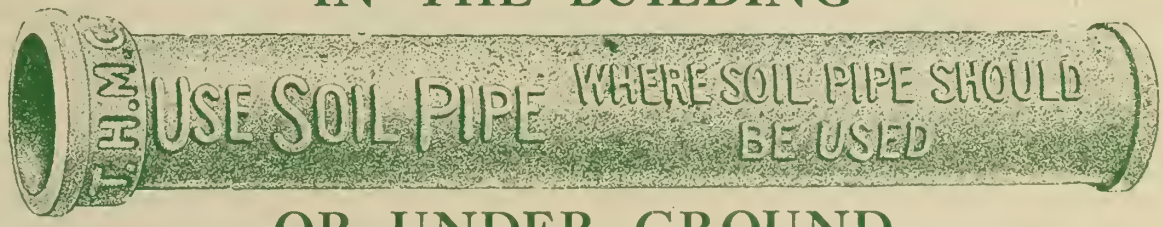

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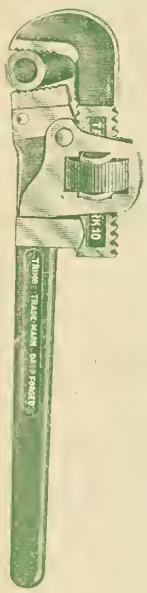

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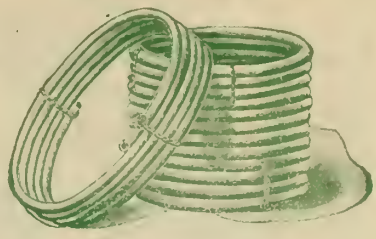

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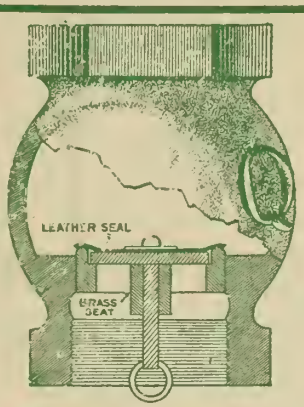

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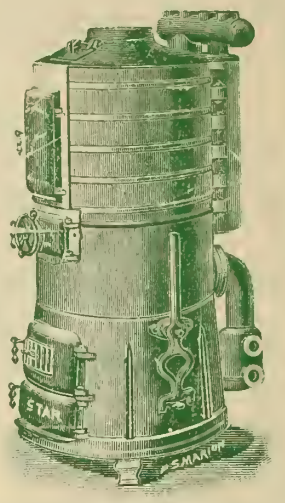

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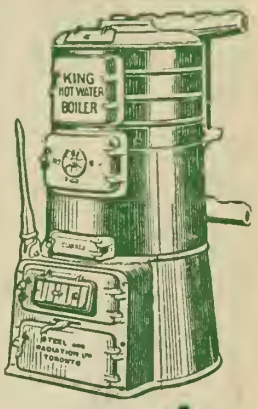

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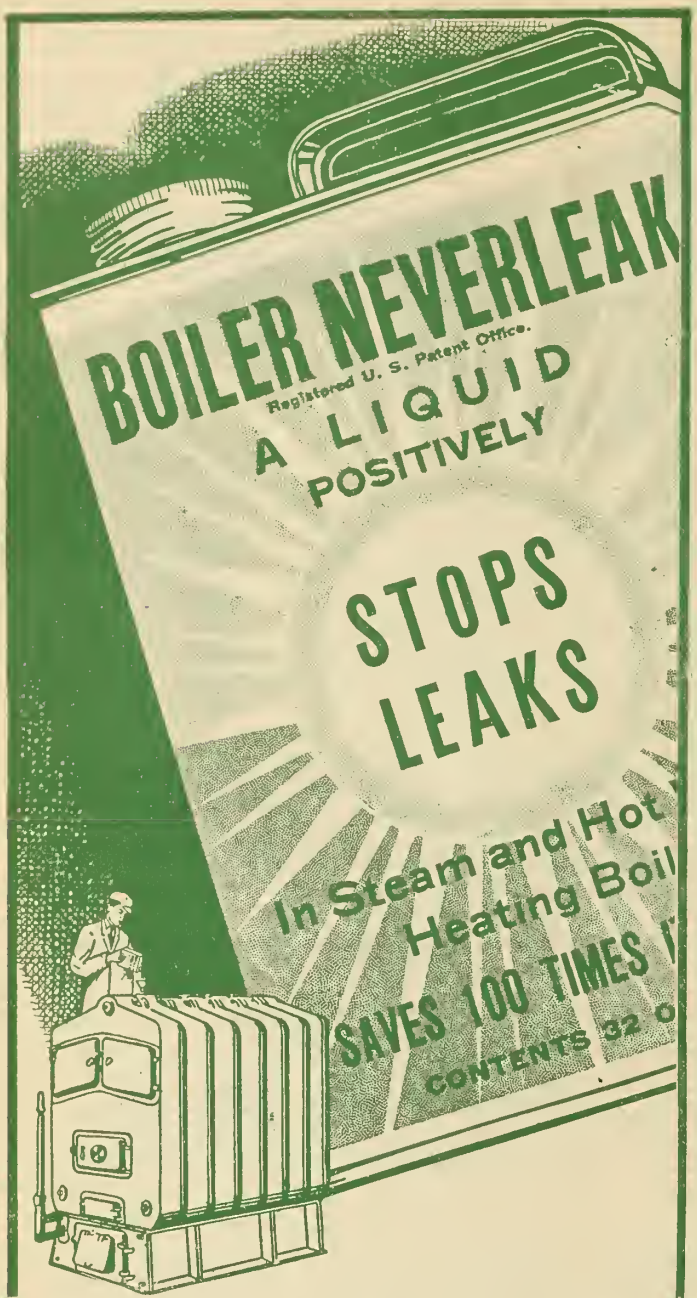

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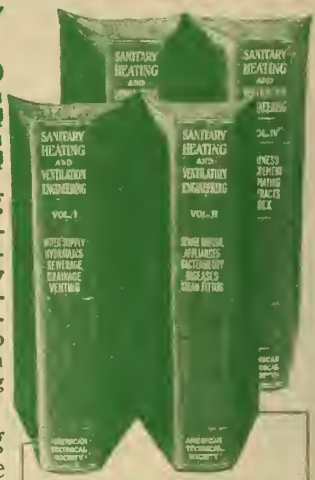

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INDEX TO ADVERTISERS

Allison, Kenneth B. 46
American Technical Society 50
Amherst Foundry Co...Inside Front Cover
Anthes Foundry, Ltd. 2
Armstrong Mfg. Co., The 52

Beaton & Cadwell 52
Beaton & Corbin 52
Belanger Regd., O. 48
Buffalo Specialty Co. 50

Canada Metal 11
Canadian Brass Co. 8
Canadian Consolidated Rubber Co. .. 48
Canadian Society Domestic and Sanitary Heating Engineers, The 44
Canadian Tube & Iron Co. 46
Canadian John Woods Co. 42-43
Chamberlain Desolvo Co. 4
Cranes, Limited 52

Dominion Sheet Metal Corp. 1

Empire Manufacturing Co. .....
Outside Front Cover

Foyle, W. & S. 52

Galt Brass Co. .....Back Cover
Gurney Foundry Co. 52

Hamilton Stove & Heater Co. 38
Hause Mfg. Co., Chas. F. 52
Hoyt Metal Co. 47

International Malleable Iron Co. ....
Inside Back Cover

Jardine, A. B., & Co. 6

Katie Foundry Co. 47
Kerr Eng. Co., Ltd.....Inside Back Cover

Long & Co., R. G. 48

McDougall & Co., R. 47
McIntyre & Taylor, Ltd. 47
Moline Heat 3
Morrison Brass Mfg. Co., Ltd., Jas.... 39
Mueller Mfg. Co., H. 37

National Steel Tank & Mfg. Co. 39

Port Hope Sanitary Mfg. Co. 24-25

Scaife, W. B., & Sons Co. 45
Steel & Radiation, Limited 49
Standard Sanitary Mfg. Co. 12
Sturtevant, B. F., Co., of Canada 41

Taylor-Forbes, Ltd. 5
Trimont Manufacturing Co. 46
Toronto Hardware Mfg. Co. 45

United Brass Founders & Engineers, Ltd. 3

Warden-King, Ltd. 49
Wallaceburg Brass Co. 7
Williams, J. H., & Co. 46
Wolverine Ltd. 9

X Laboratories 51

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As usual some fitters will get the big jobs—and do all the shouting. And the weak sisters will be meekly echoing "Me-too"—taking the leavings!

Why? Because they'll be so cluttered up with small, fussy, jobs—that they'll have no time for the big ones.

Of course, you know that the secret of success in this business is to get the small jobs cleared away *quickly and profitably*—leaving more time for big jobs.

That's why you keep "X" Liquid handy. On leaky or cracked boiler jobs it saves days of your time—much overhead and labor—and leaves you more profit than if you actually dismantled the boiler, waited for new parts, etc.

"X" enables you to tell a customer immediately what a job will cost. You take no chances with your profits—or your time.

No One Disputes the Necessity of "X" Liquid

To the shrewd, progressive steamfitter, "X" Boiler Liquid is as necessary as tools. It is part of his equipment for making profits. He uses "X" wherever he can, because it does a more satisfactory job than welding—and leaves larger profits.

Stick to the Original!

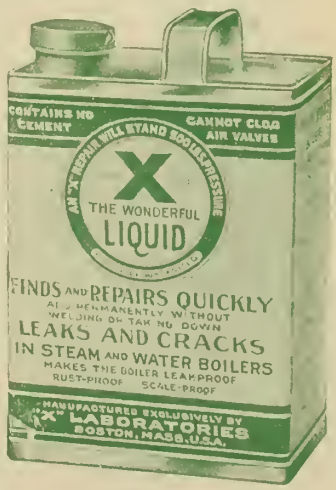
The thoughtful steamfitter isn't going to fall for anybody's say-so about something "just as good" as "X" Boiler Liquid. He knows that for best results there is nothing as good as the original "X" Liquid. An imitation can't do the work of the genuine "X" Boiler Liquid. The "X" Liquid Process is Patented. Its quality can't be imitated.

"X" Liquid is the only scientific process for repairing leaking and cracked boilers—and for making them LEAKPROOF, RUSTPROOF and SCALEPROOF. Imitations of the genuine "X" cause foaming. "X" Liquid PREVENTS FOAMING.

Over 25,000 steamfitters now use "X" Liquid regularly. "X" is used, sold and recommended by 99 out of every 100 manufacturers of boilers and radiators. It is used by the United States Government in various departments.

Keep plenty of "X" Liquid on hand for emergencies. It will make hundreds of dollars of extra profit for you this winter. When you need "X" you usually need it in a HURRY. Having it on hand means a quicker job and a more satisfied customer.

Ask your jobber or write us direct.



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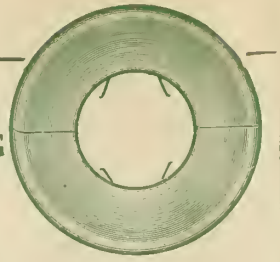

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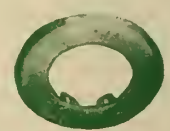

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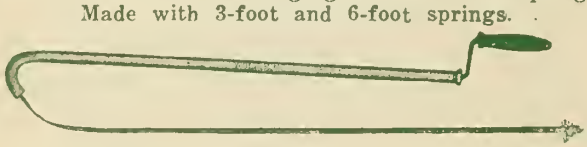

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